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By WARD HAWKINS

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THRILLING WONDER STORIES

The Magazine of Prophetic Fiction

Vol. XIII, No. 2
April, 1939

TENTH ANNIVERSARY NUMBER NEXT ISSUE!

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● ON THE COVER

Artist Brown has depicted a scene from the novelet, MEN MUST DIE, by Ward Hawkins, which appears in this issue.

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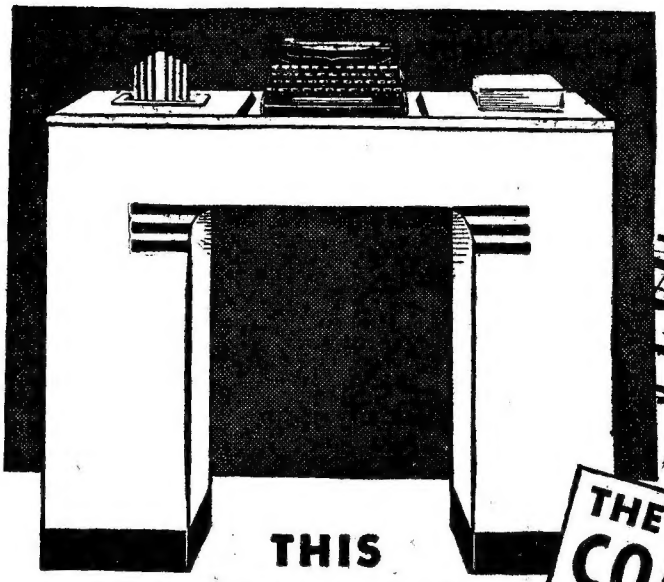

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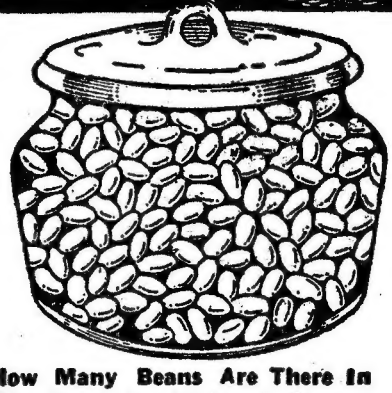
Can you count all the beans correctly in the Bean Jar pictured here? You probably think you have good eyesight. Here's a test. Can you make a perfect count of the Beans in the Jar? Try it.



How Many Beans Are There In The Bean Jar Pictured Above?

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(Number of Beans in Jar)

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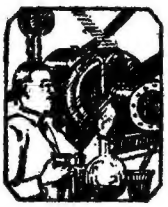

Science Questions and Answers

THE SPEED OF SOUND

Editor, SCIENCE QUESTIONS AND ANSWERS:

In a recent issue you went to great lengths to describe how scientists measured the speed of light. But how about sound? How did physicists discover that sound travels at about one thousand feet a second?

T. C. S.,
Maplewood, N. J.

First we must establish the fact that light travels at a speedier rate than sound. During a thunder shower we hear the roll of the thunder after we see the flash. The farther away the lightning discharge is, the longer the interval between seeing the flash and hearing the rumble. Everyone has doubtless seen the steam from a distant whistle, and then later heard the whistle. It is obvious, therefore, that sound travels more slowly than light.

One way to measure how rapidly sound travels through the atmosphere is to have a cannon discharged on a distant hill. We measure the time between seeing the flash of the cannon and hearing its report. In an early experiment—which was performed by some French scientists in 1738—two cannons were set up on hills about 17 miles apart, and observations were made first from one hill and then from the other in order to eliminate the error accountable to the wind.

Despite these inadequate instruments, the results of this experiment were fairly successful, and the figure reached was pretty close to the actual truth. Since then several determinations of the velocity of sound in air have been made which show that at 0° C. the speed of sound is 1087.13 feet per second. It has also been found that the speed of sound in air increases about 2 feet per second for each degree centrigrade rise in temperature.—Ed.

EARTHSHINE

Editor, SCIENCE QUESTIONS AND ANSWERS:

The moon shines; the stars shine; and the sun shines. How about our own Earth? Does it shine, too?

A. G.,
Duluth, Minnesota.

Undoubtedly Earth had a light of its own ages ago. Naturally, the other planets, too, must surely have had a light of their own at one time, just as the sun has, because the sun and the planets were all made from the same parent nebula.

But the Earth has now no light of its own because it has become cool, while the sun remains hot; so that the Earth cannot give out any light of its own, but can only reflect the sun's light. One reason is that the smaller an object is, the more rapidly it radiates away its heat and energy. The heat escapes from the surface, and the smaller a thing is, the larger is its surface in proportion to the amount of stuff in it.

You can prove this to yourself very easily. Get two blocks, one two inches square, the other one inch. You will find that the smaller block has six square inches of surface and the larger has twenty-four square inches—four times as much. Yet the larger has eight times as much stuff in it.

A child needs warmer clothing than an adult, and small and thin people need more clothing than large people, because in proportion to the mass of their bodies, they have large surfaces from which to lose heat. As regards the Solar System, we can learn especially from the moon and from Jupiter. The only reason why the moon should have become so much cooler than the Earth, though it is made of the same stuff, is that it is so much smaller. On the other hand, Jupiter is very large, and astronomers are almost certain that the giant planet is still hot enough to emanate some light of its own.—Ed.

THE EARTH'S ATMOSPHERE

Editor, SCIENCE QUESTIONS AND ANSWERS:

In the earth's rotation on its own axis (which is some thousands of miles per hour) does the atmosphere surrounding the Earth (for a distance of 50 miles) travel around at the same rate of speed, or does it remain motionless? If the atmosphere were to remain motionless, there would need be a terrific friction which would sweep away everything. On the other hand, if the atmosphere travels with the Earth, how could clouds drift against (in the opposite direction) the way the Earth was turning?

M. N.,
Rochester, N. Y.

The atmosphere does turn with the Earth, just as the waters in our lakes and mountains and seas do. Air is matter and matter is subject to the gravitational pull of the Earth. Clouds do not drift through the air; they move only when a wind blows them.

You might ask why an airplane can move through the air from east to west when the Earth is rotating from west to east. The cause is simply the force of the wind or force of the plane. The Earth's atmosphere may be considered as a mass through which a body is moving.—Ed.

NOTE

The article, "Life on Other Planets," which appeared in this department in the last issue, was based on an article in the N. Y. *Times*. The usual credit line was inadvertently omitted.

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited, we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical, also, to promise an immediate answer in every case. However, questions of general interest will receive careful attention.

Easy as A-B-C

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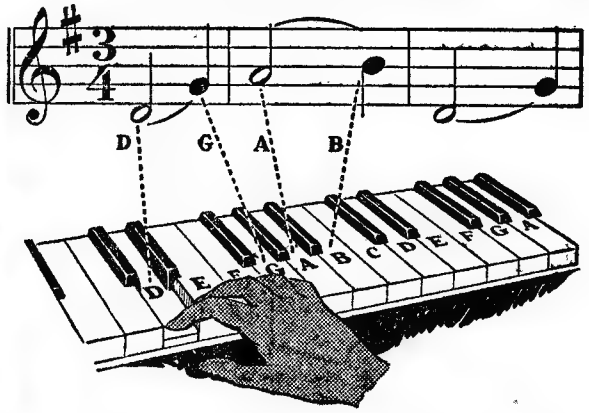

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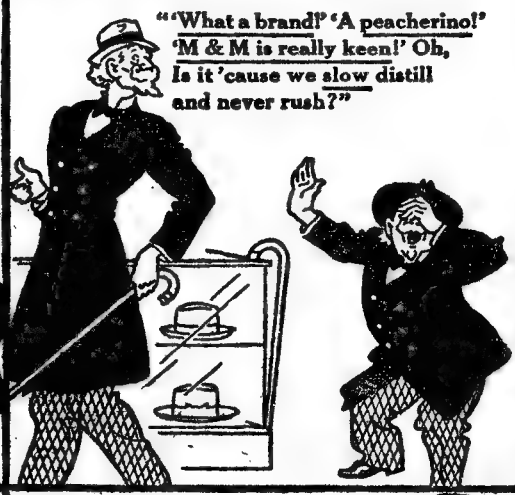

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Vol. XIII, No. 2 THRILLING WONDER STORIES April, 1939

Around the Solar System in Ten Days! Follow This Exciting Argosy of a Future Magellan

He seemed to see the spirit of Jules Verne beckoning him on

THE JULES VERNE EXPRESS

By EANDO BINDER

Author of "The Impossible World," "Life Eternal," etc.

CHAPTER I

Space Hop

THE announcer's voice vibrated with the excitement of the occasion. He was saying:

"This is the Interplanetary Broadcasting System, bringing you a word-by-word description and televised view direct from *Columbus* Space Port at New York City. The *Jules Verne Express* is about to take off on its record-smashing attempt."

He eased into less formal tones.

"Things are about all set, ladies and gentlemen. The powerful engine of the

A NOVELET OF SUPER-VELOCITY

Express has been warming up for a half hour. She's a beautiful ship—beautiful! And these eyes have seen plenty of trim speedsters in their time. If looks count at all, she sure ought to make that hop around the Solar System in record time. Pilot Perry Howe has set his mark at ten days or less. He may make it!"

Up on Pluto, four billion miles away, Royce Howe's face glowed belligerently. He was the flyer's older brother.

"Of course, he'll make it!" he half growled, looking around at the men of the outpost.

His enthusiasm brought grins to their unshaven faces. Then he turned back to the television screen. The image was somewhat distorted by weakened signals—even the powerful anti-Heaviside carrier wave could not penetrate two such barriers, Earth's and Pluto's, without some powerloss. But the long, sleek ship showed clearly. Beyond the curve of the hull, in the background, milled the spectators behind a web-wire fence set up for precaution.

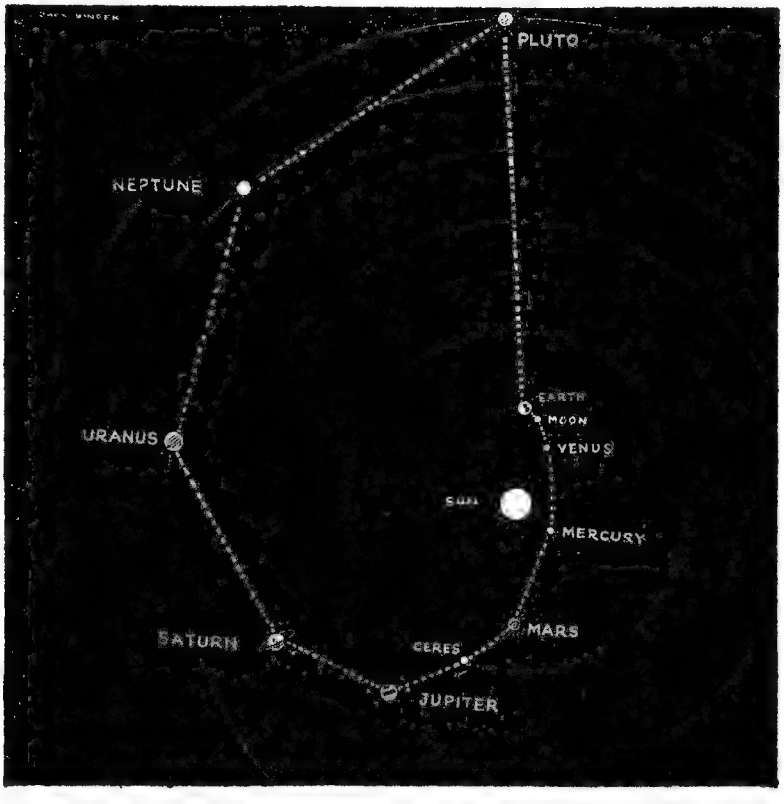
"Quite some crowd here," the announcer was saying. "At least a million! You can hear the roar of their combined cheering. And why not? This is the start of a courageous attempt at the most gruelling and hazardous run of the spaceways. LacKay first did it thirty years ago, taking ninety-eight days, with numerous stopovers for repairs. Ships have improved greatly since then. Three years ago, Stevenson set the present record of eleven days and two hours. He had to maintain an average speed of one-tenth the velocity of light! Can this boy Howe beat him?"

"You bet he can!" Royce Howe informed the announcer. "We Howes are born record-crackers. We—"

AS though this were a cue, the commentator continued:

"Perry Howe comes from a family whose tradition, more or less, has been to hang up speed and endurance records. Back in nineteen-forty, before interplanetary travel, Howard Howe, with four companions, spanned the

"She's off now, on a trip around the Solar System!"



Route of the Jules Verne Express

world in an airplane in ninety-one hours—a then remarkable feat. He later did it solo in eighty-five hours. His son, twenty-two years later, broke all non-refueling records by pushing his stratoship around the earth in forty hours.

"Jules Verne, the famous author of the nineteenth century, started all this with his imaginative work, 'Around the World In Eighty Days.' It is singularly appropriate for Perry Howe to have named his ship the *Jules Verne Express,* although he is going around a greater world, and in much less time than Verne's estimate!

"To get back to the Howes; it was in the next generation, with the advent of space travel, that a Howe established a ten-year record for the run to Mars, broken eventually by his own son. A later Howe made the first round-trip to Saturn and back, solo, in less than three days of continuous spacing. The late father of the present Perry Howe made the Pluto run in sixty hours as soon as a refueling outpost was set up there. He lost his life in a later attempt to break his own record."

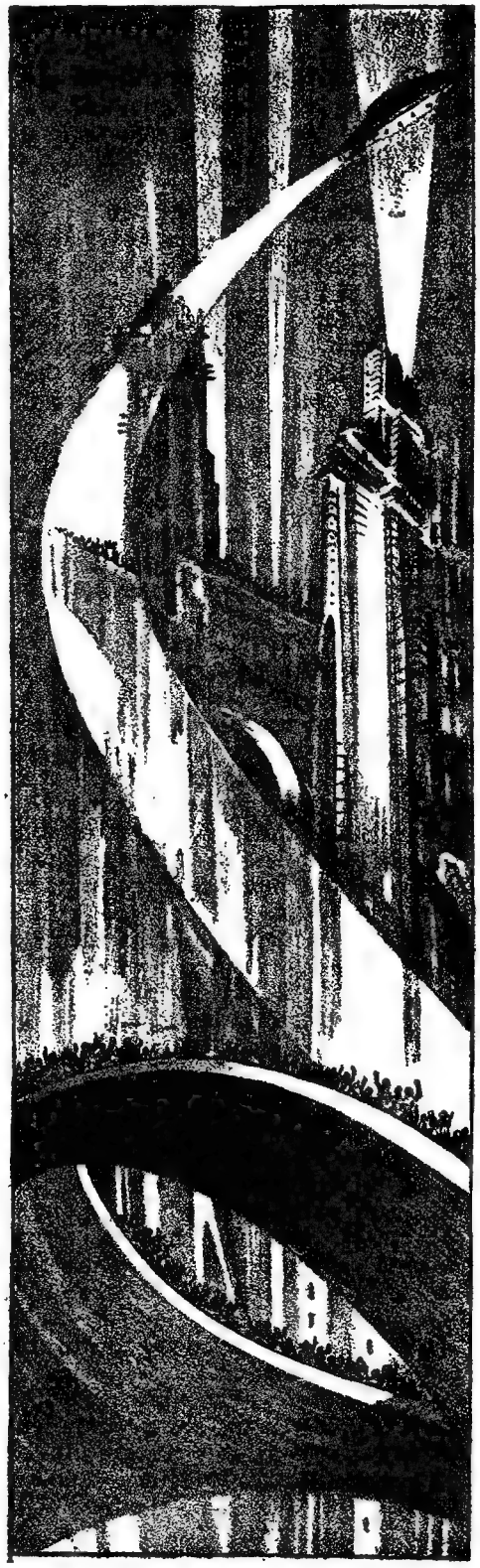
Royce Howe, sat stiffly, listening and blinking a little. The hard-bitten men behind him were silent as the radio-voice said:

"His eldest son, Royce Howe, made the standing record of fifty-five hours for the Pluto run, two years ago. He drove his ship so relentlessly that it exploded when it landed on Earth. Royce Howe escaped with his life by a miracle."

The outpost men looked at him with new respect. The quiet, unassuming young man hadn't said a word about that, and the outpost men hadn't thought to connect his name with the fame that was rightfully his.

The announcer went on:

"But in all their daring exploits, no Howe has picked a more dangerous run than the flight around the Solar System. Each planet must be visited, however they are situated relatively in their orbits. Tremendous speeds must be built up in those long stretches between the planets. It is a test of engine and man to hold up under the strain. Dozens of spacemen have tried this run and failed. Several of them were never



heard of again, lost somewhere out in the vast ocean of space!"

"My brother will make it, though," said Royce Howe confidently, as if to counteract the chill of those words. "He's the best little pilot this side of Sirius!"

The announcer's voice lifted.

"And now—here comes Perry Howe out of the drome! He is walking to his ship. With him are the mayor of New York and the usual retinue of officials. Howe's stride is springy. He seems to radiate a lot of confidence that he'll come back with another trophy for the Howe tradition!"

The iconoscopic eye back at the Earth space port swung to follow the group advancing toward the ship. Royce Howe, on Pluto, stuck his eager face so close to the television screen that he almost blocked off vision for his companions, but they did not complain. He stared at the televised moving figure of his brother. Unconsciously, he waved.

Perry Howe had the lean, wiry body common to space flyers, the strong and nervous hands that seemed ready at an instant's notice to dart toward vital controls, though he was as yet on solid ground. They got that way after a while—became bundles of triggered reflexes. Space-ship wrangling, at speeds far greater than neural currents through the human body, was not for deliberate souls. In his half-squinted eyes was tigerish readiness, and a steely stare that seemed to take in unmeasured horizons.

THE outpost men saw the similarity between the two brothers. Royce Howe, in front of them, was also lean and quick, and had that keen squint to his eyes. But he had more in his eyes—a certain haunted stare that seemed to come from the depths of his soul.

Royce Howe waved again to the image of his brother.

"Go to it, Perry!" he whispered. "Get in that speed-hull and show 'em how to burn up space! Give 'em something to talk about. Another Howe—another record! That's the way it's been with us for generations. You won't let us down, kid; I know you won't!"

He turned to the others. "I wish I could be down there for a minute, to give him a pep-talk. It always helps, in things like this. I—"

"How come *you're* not making the run," asked one of the outpost men bluntly. "Your brother doesn't look more than twenty. Pretty stiff grind for a boy."

A quick flush burned into Royce Howe's face. But not of anger. It was something deeper. He didn't speak for a moment. His flush drained and left his thin face pale. He spoke with an effort, finally.

"I haven't taken a ship into space in two years," he said in a low voice. "That accident, you see—" He clicked his teeth together suddenly and turned back to the screen, biting his lips.

The outpost men looked at one another significantly. They had heard of such things before. A grounded pilot who had lost his nerve. The accident had given him a mental hazard that he couldn't overcome. Not his fault, exactly. More to be pitied than scorned. They saw by the quiver of his shoulders that he felt what they were thinking. Tough, on a young fellow like that—and a Howe!

Royce Howe suddenly took hold of himself and turned to the men again.

"But don't worry about my brother being too young," he said. "That kid's plenty space-wise, and a born ship wrangler. He'll come through!"

A new announcer spoke. The television scene switched to a close-up of the ship's hatchway. "We will now hear a few words from Perry Howe in person. Mr. Howe, will you—"

"Hello, everyone," cut in Perry Howe's voice hurriedly, as his preoccupied face loomed in the screen. "I hope to break the record, that's about all I have to say. Hope you're listening, Roy, up on Pluto. I'll see you there soon!"

In the screen, Perry Howe waved once from the hatch-lock, then banged it shut. The ship dwindled in the scene as the portable iconoscope was wheeled back rapidly. Soon the picture showed only the lone ship as a tiny torpedo in the wide expanse of the cleared port.

The roar of the crowd died away to a murmur.

"The zero-moment is close," said the announcer. "The start is being made precisely on schedule. The planets do not wait for any man in their orbital movements. The engine has just revved to higher speed. You can hear its rumble now. And"— his voice cracked— *"there she goes!"*

Whatever else the announcer said was drowned out in the stupendous roar of the departing ship. The *Jules Verne Express* taxied down the greased runway on its retractable skids, then lifted as its undertubes spurted volcanically. In ten seconds it had vanished in the blue of earth skies.

"LUCK, kid!" murmured Royce Howe on Pluto, four billion miles from that momentous take-off.

He turned to the others. "Well, he's off!"

"He was off six hours ago," said the laconic outpost commander, Pete Perl. "It takes radio waves that long to get here to Pluto from Earth."

"Yes, I know," nodded Howe. "In fact, he's already fueled at the Moon, passed Venus, and is on his way to Mercury. But we'll have to follow the Earth reports till he gets out our way, where we'll catch up with him."

"By the way," continued Perl, "I never could understand just how a man could hit all the planets. You have to go one way to Venus and Mercury, and then the other way to find Mars. And then when you get past the Asteroids, the big planets can be almost anywhere. How in blazes can your brother stop off at all of them without spending the rest of his life traveling? And he wants to do it in ten days!"

Royce Howe laughed a little. Few people knew the details of space navigation among heavenly bodies that changed relative position with every second of passing time.

"It's a matter of course-plotting," he explained. "By traveling along tangents to orbits, you take the shortest possible route between two planets, though they may be pretty far from conjunction. Planning a round-trip in the entire Solar System is quite a thing. In fact, there are times when it's impossible—the planets are too scattered. During those times, you don't try record-runs. But during other periods, the planets line up in a way. Then your round-trip isn't so much. Three years ago, Stevenson was able to plot a route that totaled only about fifteen billion miles."

He grinned at their stares.

"That isn't so much, for a nine-planet hop. My brother, though, will have to go nearer sixteen billion miles, because Pluto here is a little further now from Neptune. It's between the major planets that you get your biggest jumps. His course will be a sort of widening, clockwise spiral."

All the men crowded around as Royce expertly drew a plan of the Solar System on a sheet of note-paper.

"Look," he resumed, when done. "From the Moon, he goes almost tangent to Venus' orbit, in toward the sun, and hits Venus a quarter of the way around. Then to Mercury's orbit, again in a tangent. Actually, he is now almost on the other side of the sun from Earth. He then strikes directly out to Mars' orbit, in almost the same line as his flight from Earth. After the stop at Mars, he turns clockwise a few degrees, and hits Ceres. That's part of the rules, you know, to make a stop at one of the Asteroid fueling stations.

"From then on, he jumps to Jupiter, Saturn, Uranus and Neptune in regular order, as they all happen to be further along, in a clockwise direction, in their orbits. Out here's where most of his time will be taken up. The stretch from Earth to Jupiter, stopping at five planets, will take only about twenty-two hours. To take in the other four planets, will take over two hundred hours—almost ten times as much distance to cover. When he gets here to Pluto, he'll have the longest single hop left—from this planet to Earth, about four billion miles."

"If he gets here!" said one of the men pointedly. Jed Alcher, a big and loud-voiced bully among the men, took particular delight in making others squirm. "You heard what the announcer said about space pilots getting lost, trying this run. If your brother's

no luckier than they were, he might crack up out in space, too!"

ALCHER looked around proudly as though he had said something witty. Royce Howe's face flushed. He glared at the man.

"Why, you—" he grated.

He tried to lunge at him, but Commander Perl blocked him.

"Take it easy, Mister," he said calmly. "We know how you feel about it."

Royce Howe relaxed. "Sorry," he muttered.

The commander whirled to face his men. "Listen, fellows, Howe is under pretty much of a strain and will be until his brother gets here. So pipe down with those cracks!"

"Hell, I didn't say anything wrong," protested Jed Alcher. "Danger's danger." He was looking at Howe as he went on boastfully: "And if you think you space flyers are the only ones with guts, what about us? Two or three times a year one of us goes out digging —and never comes back! We—"

"Shut up!" roared Commander Perl, as the men looked at one another uneasily at having this almost tabooed subject brought up. "Okay, men—get going. Rest period's over. There's plenty of radamite to be dug up."

CHAPTER II

Cosmic-Ray Burns

WHEN the men had clumped out of the large triple-lock, Perl turned to Royce Howe.

"Don't mind them," he half apologized. "They're rough and tough and like to ride a guy at times. But they've got courage. It takes courage to be on Pluto, digging out in the frozen wastes." He sighed, with a certain gaunt look in his eyes, then went on. "This stopover for your brother must be pretty important, for you to be here. You've been here two weeks, since the last supply ship came. You could have just sent the fuel, and we'd have taken care of the refueling."

Royce Howe nodded. "Yes, but I wanted to help him all I could. When he gets here, he'll be pretty fagged, with the biggest stretch of all still ahead of him. A little pep-talk from me may help a lot. Especially if he's close to the record and needs some encouragement to give all he's got for the home stretch."

The commander's frost-bitten face broke in a grin. "That record business seems to mean a lot to you boys."

"More than all the dollar-a-gram radamite ore you would dig in ten years!"

A half hour after the take-off from Earth, the radio took up the thread again, from the giant Lunar space drome.

"Perry Howe just arrived here, smiling and energetic. He helped our men load fuel aboard, too impatient to just stand around. As is customary on all Earth-elsewhere record hops, Howe is taking on his full fuel load here. He came from Earth with barely enough to get here, saving the drag on a full fuel-cargo in Earth's greater gravitation."

There was no television from the Moon, But Royce Howe could picture his tall young brother dragging tins of reserve fuel to the rear hold.

"That's the spirit, Perry!" he murmured. "But don't tire yourself out."

"There went the last tin," said the IBS announcer. "Howe jumps into his lock and closes it in one movement. You can tell that boy is in a hurry! There go the rockets—the ship darts forward like an arrow—it rises—it's gone! The *Jules Verne Express* is on it's way to Venus, the first leg of the stupendous journey around the Solar System. Good luck, Perry Howe!"

"Amen!" breathed Royce Howe on Pluto.

"I'm not much up on space navigation," observed Commander Perl, "but why should it take him a half hour to get to the Moon? If he can get up to 1/10 the speed of light, as Stevenson did, the Moon hop shouldn't take more than a few seconds!"

"It's a matter of acceleration," informed Royce Howe. "Acceleration takes time, especially to build up to fractional light-speeds. You need room, because you have to have the same amount of time and space for de-

celeration. The Moon distance is so short that you can't begin to build up speed. It'll be the same with the hops to all the inner planets—Venus, Mercury and Mars. Perry won't be able really to open up until he heads out Ceres way."

He continued thoughtfully.

"And that's where the record will be broken, if at all. It depends on how much a man can stand in the way of acceleration and deceleration, and how good his engine is. The inertialess field within the ship, of course, can cut sixty gravities of acceleration to six, but even nine hundreds pounds of acceleration-weight for several hours is no fun.

"Nine to ten is about the limit the human body can stand. After Ceres, on the long stretches between the major planets, it's mostly a matter of building, as quickly as possible, to top speed—which is limited by fuel consumption—and then 'coasting' for millions of miles before decelerating. And Perry has a billion miles to make up out there! It'll be a tough grind."

TWO hours later, the IBS piped in Perry's Howe's first direct communication, space static conditions permitting.

"Howe reporting, *Jules Verne Express,*" came the thin, ghostly words from the void, to thrill millions of listeners. "Everything fine. Engine working smoothly. I'm half-way to Venus, starting deceleration. My cosmic-ray shield worked loose during acceleration, from vibration, but I bolted it down. All else okay. Signing off."

Four hours later, Venus reported.

"Perry Howe's *Jules Verne Express* was just sighted at the Dryland Space Port. He did not stop for fuel or repairs of any kind. In accordance with rules, he rocketed through atmosphere at less than five hundred miles an hour within two miles of the surface."

Royce Howe explained to Commander Perl.

"He won't have to stop for fuel till he gets to Mars, because the hops are so short. An official visitation to a planet on a record spacing is five hundred-two, as the announcer explained. But his time, I'm afraid—" He frowned, looking at the clock.

"Here's the official check-up on his time!" rang out the radio-voice. "Perry Howe has negotiated his first forty million miles, from Earth to Venus, in two hundred and forty-six minutes. This is seventeen minutes *behind* Stevenson's time for the same lap, though Stevenson went an additional two million miles. Howe will have to do better than this if he expects to break any records!"

Royce Howe grunted.

"I thought so," he muttered. "Seventeen minutes behind! Come on, Perry, what's the matter? I wonder if that ray shield delayed him—"

The announcer's voice broke in excitedly.

"A report just came in from a ham radio-operator at the outskirts of this city. He sighted Howe's ship. It was only a mile up, and going rather slowly. Through binoculars, he watched and saw something drop from the ship, in several large pieces, into a bare field. He investigated and found they were the broken parts of Howe's cosmic-ray shield.

"Howe spoke of the shield working loose during acceleration. Evidently it was damaged and worked loose again completely, as sometimes happens, so that he had to toss it out. Howe hasn't reported as yet if he's going to give up the run. Evidently he isn't. But it's a dangerous thing to go on. He has no protection at all now from the cosmic rays!"

Royce Howe jumped up and began pacing with his hands clenched behind him.

"Something always has to happen, no matter how carefully you plan!" he said bitterly. "His cosmic-ray shield, of all things!"

Commander Perl asked, "Is it really dangerous without that?"

Howe nodded.

"On any planet with even the thinnest of atmospheres, the cosmic-rays are pretty well absorbed. But out in space, they're terrific. All space ships have, inside the hull, a layer of lead stuffed with neutrons that stop the rays. But to eliminate weight, spacers

on record-runs don't have the hull-wall layer. They simply have a small shell of the lead around their pilot seat, and stay inside of it as much as they can."

He groaned a little. "Now my brother has no protection from the rays. He'll get a bad cosmic-ray burn on his skin in ten days out in space. It's worse by far than sunburn. Sometimes it's fatal. Oh, the fool—he shouldn't go on!"

"He shouldn't—even for the record?" asked Perl blandly.

"The fool!" repeated Royce Howe, but his tone had changed to admiration. "The nervy little fool—bless him! The record's the thing! That's our motto. I'd have done it myself."

PERRY HOWE came through the IBS system an hour later.

"Perry Howe, *Jules Verne Express.* Unloaded my cracked cosmic-ray shield back on Venus. It was useless weight anyway. Results gratifying too—three per cent better acceleration! Everything fine. Signing off."

"Likes to talk, doesn't he?" commented Perl, taking out a big plug of tobacco and biting off a man-sized chew. Smoking, wasteful of oxygen, was prohibited in the outpost dome.

Royce Howe declined a chew. "Three per cent better acceleration—that's a lot. He'll shave some time now, that fool brother of mine!"

Perl was puzzled. "But how does he gain anything? There's no weight out in space. What difference does it make if he has a few pounds more or less? It's zero weight out there."

"Weight is a trick term," returned Royce Howe. "It changes from planet to planet. Fifty pounds on Earth is only forty-five pounds here on Pluto, and it's a hundred and twenty-five pounds on Jupiter. But *mass*—quantity of matter—stays the same. Also its inertia. In rocket propulsion, your acceleration is proportional to the speed of ejected gases *and* mass. Lighten the mass and you get more effect out of your rockets. Perry's gained all right, but now he's out there, with the cosmic-rays beating down on him—"

He stopped, shaking his head worriedly.

When Mercury reported, Perl's men had come back from their digging, cold and cursing. They crowded around the radio, their only contact with outside life. They grunted when told of the cosmic-ray shield. Daring men themselves, they appreciated the same quality in another who was defying the worst that space had to offer.

"The *Jules Verne Express* just passed over at five hundred-two," said Mercury's announcer. "His official time for the sixty-nine-million-mile lap between Venus and Mercury is one hundred and eighty-two minutes! This is thirty-four minutes less than Stevenson's time. Perry Howe isn't fooling now!"

Royce Howe, listening, looked happy. "Keep it up, Perry!" he murmured. "You've got the record by the tail now."

Commander Perl was mumbling. "He takes two hundred and forty-six minutes to go forty million miles, but only one hundred and eighty-two minutes to go sixty-nine million. What kind of a—" his eyes lit as he thought of the word he wanted—"paradox is that?"

"More room for acceleration," explained Royce Howe, smiling around at the puzzled stares. "He'll make the Mars run, twice as far, in still less time. Watch and see!"

But before that, the IBS again picked up Perry Howe direct and broadcast his message to the sport-loving Solar System.

"Howe. Passing the sun now, at a distance of thirty million miles. Cabin temperature up to one-twenty degrees, but I feel okay. I'm sweating more over these tangent courses I have to revise. I'm ten minutes ahead of every schedule I brought along from Earth. I'll have to slide-rule myself along from now on. Attention please, Lowell Space Port, Mars. Have a large jar of cosmic-ray burn cream on hand when I arrive. Signing off."

"Good thing Perry went to Tycho Astronautic Institute," sighed Royce Howe. "He's an expert with the tangent slide-rule for space plotting. Gilder, in his attempt at the record last year, lost out when he missed Mars by ten million miles. He was a hun-

dredth of a degree off course. At these speeds and distances, you carry everything to the seventh decimal place."

MARS came in strong and clear with its superpowerful station a while later.

"Here comes Perry Howe! He has just roared out of space at a terrific clip. His silvery ship looks like a visible bullet as it drops from the sky. It—*he's going to crash!* Good God—"

There was a horrified moment of silence, while Royce Howe's knuckles cracked as he gripped his chair. Yet he was not too startled. Space flying was a dangerous game all the way through. Disaster could strike, like a coiled snake, at any given moment. He gripped himself for the coming shock.

"No, no!" blared the announcer's voice finally. "Excuse me, ladies and gentlemen. I let my emotions run away with me. Howe made a perfect two-skid landing, but at a rate of speed never before seen in *this* port! He had it all planned to a split-second. He stopped with a burst of the retarding rockets only ten feet from the hangar and his cached fuel supply, which he must have spied. What a pilot that boy is!"

Royce Howe sank back in his chair, breathing again. He pressed a hand to the back of his head, wincing a little at the painful picture that had seared momentarily across his brain. That accident of his own two years ago—blinding lights before his eyes, crashing thunder in his ears, sharp pain stabbing into his battered brain— It had been awful. He shook the recollection out of his mind.

The men behind Royce Howe resumed their tobacco chewing, which they had suspended when a crash seemed imminent. Some of them voiced their admiration for the young space flyer's nerve. Royce Howe glowed.

"They're hustling fuel into the ship as fast as they can, Perry Howe helping," resumed the Martian reporter. "He looks fresh as a daisy. However, his face and hands are pretty dark looking, and probably all his skin under his clothes. The cosmic rays have started their burning. We have his cream ready for him. The director of the port suggested that Howe let them install a new shield, but Howe refuses to waste those precious hours it would take. That might mean the margin of the record.

"Here's the official time. Mercury to Mars run, one hundred and twenty-five million miles—one hundred and twenty-one minutes! He is now an hour and five minutes ahead of Stevenson's time at this point.

"The loading is done, and there goes Howe into his ship. He waves. The lock bangs shut, the ship backs, whirls like a top, shoots down the runway. It rises. The *Jules Verne Express* is off for Ceres and the great open stretches beyond!"

CHAPTER III

Reunion on Pluto

COMMANDER PERL arose and yawned.

"Well, it's the end of the day—or what goes for day here on New Siberia. Off to bed, men. Coming, Howe?"

The latter looked up at him almost scornfully.

"Me sleep? I won't be able to sleep until he gets into the big stretches." He popped an ammonia tablet into his mouth and turned back to the radio.

"Dig radamite for a couple of hours," suggested Alcher sarcastically. "Then see if you wouldn't sleep!"

The men filed into the bunk room, grumbling among themselves.

Commander Perl returned after his inspection tour of the heating and air apparatus of the dome, on which their lives depended.

"Can you sit in the dark, Howe?" he asked. "Our battery current is rationed just like food and air."

"Of course," acceded the other promptly.

Royce Howe sat in the dark, listening to the IBS's variety program. He barely heard the music, advertisements, and radio skits. With half-closed eyes he imagined himself out in the void, in the *Jules Verne Express* with his brother, defying the stars. But a chill

gripped his heart at the thought, and the haunted look in his eyes grew deeper.

If he were out there—he shuddered. He couldn't be, not after the accident. The best he could do was to whisper words of encouragement to the lad out there, racing against the measured pulse of the Universe. His mouth was a little bitter.

Two hours later, his vigil was rewarded.

"Howe, *Jules Verne Express.* Had a chance to open up a bit. Reached velocity of eighteen thousand miles per second before deceleration, with five and a half G's limit. Ceres invisible as yet. Hope I've plotted right. Have the rayburn cream all over my skin—helps a lot. Feel fine. Everything shipshape. Hope you're listening, Roy. Sit tight on Pluto till I get there! Signing off."

"Sit tight!" echoed Royce Howe. "I'm sitting on pins and needles for you, kid. Wish I could talk to you."

Ceres' report, from its weak station, was shot through with the catcalls of space static.

"Perry Howe flew over at five hundred-two. His time, Mars to Ceres, two hundred forty-eight million miles on tangent course—four hours and three minutes!"

"Three hours ahead of Stevenson's time since leaving Earth!" said Royce Howe to himself contentedly. "Perry, old kid, you're going to bust that record all to the devil!"

It was "morning," and the men were having their unsavory breakfast of vita-biscuits when the next report came in. The IBS had been unable to pick up Perry Howe at any time during the Jupiter run, due to the exigencies of sunspot activity. Royce Howe had been as taut as a stretched wire during those long hours. Without even the thin thread of radio communication to follow the ship's course, he imagined it lost in a dozen different ways.

"Ganymede reporting!" came from the radio finally. "Howe has landed and is taking on fuel!"

These prosaic words were like a soothing balm. Royce Howe relaxed, going as limp as a rag.

"Ceres to Ganymede, Jovian System, five hundred and fifty million miles," went on the radio-voice. "Time—eight hours and forty minutes. This lad Howe is certainly pushing his ship along. He's now almost ten hours ahead of Stevenson's time. He must be scorching a hole right through space. But can he keep up the pace without burning out his engine? Our mechanics looked it over. The power-exhaust tubes are pitted rather badly. They may not hold up, unless he keeps his engine heat down. Howe laughed at the report. There he goes now—like a streak of superlightning!"

"Sounds serious—about those tubes," said Commander Perl. "Any danger they might crack off?"

Royce Howe spoke confidently. "They're special alloy. They would hold up to Orion and back." But there was a slight note of worry in his voice.

THE cycle of life went on under the dome, but time passed like a dream to Royce Howe. He ate when Perl forced him to, and continued to take tablets to stave off sleep.

The IBS picked up Howe's faint signal when the night period had come again to the dome.

"Perry Howe. Opening up now. Plenty of room out here. Last triangulation showed my speed at twenty thousand. I'll reach twenty-five I think. Engine slightly over normal heat, but nothing serious. Made for punishment. My skin itches from cosmic-ray burn, but the cream liberally applied relieves it. Signing off."

Saturn reported the next day, as the outpost men came in for their rest period.

"Titan, Saturnian System. *Jules Verne Express* arrived before we expected, but there is no delay in refueling. Time, Jupiter to Saturn, twelve hundred million miles—eighteen and one-half hours!"

"Fifteen hours ahead of the record!" breathed Royce Howe happily. "Perry is going to come in under the wire in less than ten days, which would be a real record!"

The voice from Saturn went on.

"Mechanics adjusting the feeder valves, for Howe says his engine hasn't been helped by prolonged overheating. Power-exhaust tubes are pitted badly.

Howe advised to stop for replacements, but has declined."

"That's the stuff, Perry!" said Royce Howe earnestly. "You can't stop for replacements now. It would take hours and hours. Up and at it, kid—they'll hold!"

"You're a great one for cheering a guy on," said Jed Alcher sourly. "Wonder if *you* would take a chance?" He went on heartlessly. "Aren't you the guy who lost his nerve?"

"Shut up!" roared Commander Perl, moving in front of Royce Howe, who had jerked up.

Howe relaxed, but his face was pained. "I'd take the same chance, if it weren't for the accident," he said quietly. "With us, the record's the the thing."

The announcer was saying, candidly: "Perry Howe himself doesn't look so good. He's almost black from ray-burn and his face looks strained. The terrific pace he's kept up so far is telling on him. But there he goes back into his ship, with a game grin. He's off!"

"Now come the three big stretches," sighed Royce Howe. "Uranus, Neptune, and Pluto. If he keeps up the pace he has, he'll make it in ten days total time, just as we hoped!"

"If he keeps it up," came Alcher's loud, blunt voice from the back of the room, "he'll come limping in here with burned-off tubes, or he won't even come limping—"

"Or the cosmic rays'll get him," said another voice.

Commander Perl hustled his frank-tongued crew toward their space-suits, cursing them roundly.

Royce Howe looked after them with burning eyes. "You don't know us Howes'!" he yelled. "We can take it!"

"Yeah? Come and dig radamite some time—"

IT was that evening Royce Howe experimentally tuned his brother's wave-length, though there was little chance of picking him up across the gulf between them. But by some freak of spatial conditions, a message came through direct.

"Perry Howe. Reached top speed of twenty-six thousand miles per second this time, at fuel limit. Coasting now for Uranus. Engine standing up. Saturn was a beautiful sight, with its rings and moons. Ray-burn a little painful now, but not worse than I expected. Bit tired. Had to take three ammonia tablets to keep awake last time. May grab a few hours' sleep soon, if triangulation shows I'm on a straight course. Otherwise, I'll have to keep playing with the offside rockets. Got a bit of bad aim leaving Titan. Signing off."

Ten minutes later, the IBS broke off in the middle of a program to pipe through Perry Howe again.

"Perry Howe. Reached top speed of twenty-six thousand miles per second this time, at fuel limit. Coasting now for Uranus. Engine standing up. Saturn was a beautiful sight—" Word by word Howe's report was repeated.

"Say," gasped Commander Perl in amazement. "That's the same message we heard before! How's that?"

Royce Howe laughed. "The bee-line distance between the ship and us must be about—let's see—a hundred and ten million miles less than the combined distance from the ship to Earth and Earth to Pluto. He's well around on our side of the sun now, in his spiral course. He's drawing nearer every minute"—he failed to stifle a yawn—"mile by mile."

"It'll still take him six days to get here," said Commander Perl practically. "In the meantime, you'd better get some sleep or he'll find you laid out when he arrives."

Royce Howe almost staggered to his bunk.

The IBS came through faithfully for the next report.

"Oberon, Uranian System, reporting. The *Jules Verne Express* just landed and is being refueled. Time, Saturn to Uranus, twenty-five hundred million miles—thirty-six hours. Howe says his engine will hold out. But the question is, will *he* hold out? He looks pretty haggard."

Royce Howe began pacing the room.

"He's driving himself and the engine to the limit," he muttered. "Wish I could tell him to take it a little easy. He's nineteen hours ahead of Steven-

son's time now. He could afford to ease up. But the young fool won't, of course. He's after that ten-day record." He sighed. "Well, I can't blame him. I'd do the same myself—if I could."

Commander Perl looked at him queerly, but said nothing.

No report could be picked up from Perry Howe all during the next giant hop. Royce Howe tried his own tuning and the IBS a dozen times an hour, but picked up only the annoying crackle of space static. Again disturbing fears wracked him.

BUT finally, two sleeping periods later—

"Moon of Neptune reporting. Perry Howe arrived safely, and he is now refueling. Time, Uranus to Neptune, three thousand, two hundred million miles—forty-six hours. Engine and man both look battered. Howe staggered out of his ship, and staggered in. His skin is blistered in places. He's making a game try of it. It's doubtful if he can go on—but he is! Yes, sir, there goes his ship, taking off as beautifully as though he were fresh at the start of this grueling race against time. But he may turn back yet. It's doubtful that he can—"

Royce Howe snapped off the radio.

"Doubtful, hell!" he growled. "My brother will come through, ship and all." His eyes shone. "He'll be here on Pluto in two days!"

Royce Howe kept the radio open on his brother's wave-length, now that his ship was closer than the relay distance from Earth. A message came through hours later, in a voice cracked from strain rather than static.

"Perry Howe, *Jules Verne Express*. Got her up to twenty-seven thousand this trip, playing my luck with the engine. Coasting now, for Pluto. Aim good. Can't sleep—the ray-burn keeps me awake better than ammonia tablets. Try it some time, folks! Be seeing you soon, Roy. Hold Pluto down for me! Signing off."

A day later his voice sounded again, hollowly.

"Perry Howe to Royce Howe, Pluto. Went over the engine and tightened things up while coasting. Patched power tubes with refractory cement. Think they'll hold up. But maybe—maybe I won't! I hate to say it, Roy, but I'm near licked. This ray-burn has knocked me lower than I thought it would. So in case I can't make the home stretch, Roy, don't be too disappointed. At least it'll be an eight-planet record run. Signing off."

"He's on his last legs," said Perl softly. "You can tell that by his voice."

"He must go on!" hissed Royce Howe. "The record's the thing!"

"Yeah?" piped up Jed Alcher loudly in his blunt tones. He glared at Howe with a cynical twist to his lips. "Talk is cheap. Your brother's a man, the way he drove against odds. Would *you* take a chance driving a ship that might blow up, even without the ray-burn?"

Royce Howe went white, but made no move to avenge the open insult. Instead, he slumped down, with his head in his hands. The outpost men stared at him, uncertain whether to sympathize with him or condemn him as a braggart.

The *Jules Verne Express* came down with a thunderous belching of its undertubes, like a fire demon. Space-suited figures ran toward it from the dome, through the swirling flakes of frigid atmosphere. At the top of the dome burned the brilliant magnesium flare that was always lighted to guide space ships through the general murk of the atmosphere.

After a moment the outer lock opened and Perry Howe's space-suited form emerged. He dropped to the ground, fell to his knees, but struggled up alone, pushing his brother and others away. With violent gestures he indicated that the refueling should start, as though he had made up his mind to continue despite his last message.

CHAPTER IV

Last Leg

PERRY HOWE tried to help the men carrying tins to the rear hold, but gave up, leaning finally against the

ship's hull. Royce Howe ran back and forth through the thick pall of Pluto's eternal snow-storm of frozen gases, urging the men to hurry though he knew they could not hear through their suits' tough fabric.

Fifteen minutes later they were done. Royce Howe came out of the space ship after his examination of the engine. He took his brother's arm and half carried him to the dome. The men followed. Inside, Commander Perl had just finished flashing the report to Earth with his sending apparatus which was used only in emergency.

Perry Howe took off his helmet. Everyone gasped. His skin was purple-black from cosmic-ray burn. Broken blisters, raw looking, ran down the soft skin of his cheeks. He grinned twistedly through his unshaven, unwashed mask of a face.

But his voice was a hoarse thick croak when he said: "I thought I might go on for a minute, but I can't. I'm done up! This ray-burn—pain—itching—no sleep—no rest. Nerves shot—" He spoke groggily, like a man half-conscious on his feet. His face twitched with pain and utter exhaustion. Its youthfulness accentuated the lines of haggardness.

Royce Howe stared at his younger brother pityingly, but then his face went a little hard.

"You've come this far, Perry," he said tersely. "You've got to finish. The record's the thing. You have a bad burn, but it'll have to be treated on Earth, anyway. There are no facilities here. You're too tough to be in actual danger from it."

"Yeah, the record's the thing," repeated the young flier, as though he had been chanting it in the past hours. "But I can't—make it. Sorry, Roy, can't—" He dropped into a chair like a falling weight. His head rolled.

Royce Howe grabbed up an oxygen bottle handy for emergency and opened the valve directly under his brother's nose. The sharp draught quickly revived the exhausted space flier. Then Royce Howe jammed three ammonia tablets into his mouth and shook him by the shoulders. His brother winced with pain where raw blisters lay under his suit, aggravated by its roughness.

"You've got to, kid!" Royce Howe growled in his face. "Do you hear? You can't let yourself, and me, and the name of Howe down. The eight-planet record wouldn't be anything to the nine-planet record you have within grasp. It would be second-hand glory. It's up to you to finish—understand!"

The outpost men were muttering. Commander Perl spoke.

"Why not let him rest a few hours? He's twenty-five hours ahead of Stevenson's time. Beating that is all that counts."

"Can't let him rest here," cried Royce

[*Turn page*]

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Howe. "Put him flat on his back, and he'd stay down for a week, condition he's in. He *can* go on! There's always a reserve of strength and endurance in a man that comes out at the last. Perry, you *must* go on! Perry—"

THE young flier had again fallen senseless. Royce Howe reached for the oxygen bottle. Commander Perl put a hand on his arm, preventing him.

"I dunno," he said, shaking his head. "Don't drive the kid to doom. He might start off okay and then lose consciousness on the stretch and drift out to get lost for good. You better let well enough alone, record or no record."

"The record's the thing, eh?" spoke up Jed Alcher suddenly. "Well, here's your chance, Howe! You've been talking that ship across space all this time. Why not *take it in yourself?*"

A tense hush came over the men in the dome. Jed Alcher had brazenly voiced a thought all the outpost men had had. Life on harsh Pluto had made them all hard. They revered one quality above all others—courage. They could only despise a man who lacked it. And even Commander Perl, for once, failed to step in to protect Howe from this mental inquisition.

Royce Howe knew he had to answer. And he knew he would be judged by his reply.

"It—it wouldn't stand up to Stevenson's solo record," he stammered lamely.

"No, but it would be a time-record in its own class!" pursued Jed Alcher cruelly. "I see something as plain as day. You covered up with all that talk about the record, but you wouldn't take a chance on the engine yourself, because you once had an explosion. I saw you go in and look the engine over, Howe, and your face gave you away when you came out!" He pointed his thick finger. "Look at him, men—willing to send his own brother—"

"Stop!" said Royce Howe, his voice like a pistol shot. "You're wrong, Alcher. The engine will stand up, I swear it. I know engines. It's taken a lot of punishment, but it'll easily hold up until Earth."

"Then why don't you take the ship in?" said Jed Alcher relentlessly. "Are you *afraid?*"

Royce Howe looked around wildly, as though seeking a way of escape. But there was no escape from the accusation that seemed to vibrate in the air like a living thing. Even Commander Perl looked at him searchingly, condemningly.

"I can't take the ship in!" Royce Howe said hoarsely. "I tell you I can't. If Perry were awake, he'd tell you how it is. You see, I—"

"Lost your nerve completely, eh?" broke in Jed Alcher sneeringly. "Pah!" He spat on the floor contemptuously. "I can see the yellow streak up your back, right through your clothes!"

Royce Howe's face went white, and he opened his mouth as though to pour out a flood of hot words. But suddenly his eyes glazed. He knew that nothing he could say now would change their opinion. They had branded him, and only one thing could take away the stigma. Sweat came out on his brow.

Suddenly he snapped himself erect. He faced the men whose eyes held stony scorn.

"All right!" he barked. "I'll take the ship in! Help me carry my brother to the ship. The quicker he gets to an Earth hospital, the better."

The tense atmosphere broke. The outpost men relaxed their grim faces. In their rough way, they felt justice had been done.

"Well, that's more like it!" rumbled Jed Alcher grudgingly. "Now smoke that ship to earth and—well, good luck!" He stuck out his hand, all animosity gone.

Royce Howe shook it, but the sweat still stood out on his forehead. He had a queer look in his squinting eyes, as though he foresaw doom.

"It isn't as bad as all that," said Jed Alcher, with surprising good grace. "You have plenty of chance of coming through. You said yourself the engine looked okay." He himself carried the limp form of Perry Howe to the ship.

ALL the men were out there, watching, as Royce Howe closed the outer lock and vanished from view. The engine had been idling since the

landing and was ready for take-off. But the ship did not leave immediately. For long minutes it remained there on the frozen surface of Pluto, its long streamers of flame beating into the frigid atmosphere.

The outpost men stood wondering at the delay. Jed Alcher was muttering to himself.

"Losing his nerve again, probably. If he comes out—"

He started. The hatch-lock did open. But only a hand appeared to toss something white in their direction. Jed Alcher picked it up. It was a rolled piece of paper, with a metal weight attached to it so that the winds would not blow it out of their reach.

Then the ship's engine thundered out violently. The long, sleek craft slid forward and lifted smoothly after a short run. In seconds, the vermilion flare of its rockets had receded into the gray vault of the Plutonian sky.

The *Jules Verne Express* was on its way to Earth, on the last leg of its tremendous journey around the Solar System.

Inside the dome, Commander Perl unrolled the paper and read its hastily scrawled message, first to himself, then aloud.

"Commander Perl and the men of the outpost," he read, "I'm going to drive the ship as hard as I know how, toward Earth. And then I'm going to die. I should have explained, but you wouldn't have believed me anyway. Besides, this is the only way to get Perry the record he deserves. I'm glad it's turned out this way.

"That explosion of my ship two years ago ended my career as a pilot. As the Earth announcer said, it was a miracle I lived. A tiny sliver of steel lodged itself in my head, touching my brain. They couldn't remove it as they had removed the other pieces of metal in my body. The operation would be certain death. It is there yet. At any moment, in the past two years, it might have moved into my brain, killing me.

"The doctors told me that. And they said I must never pilot speed ships again, or ride any ship in space that went faster than average rates. There are many free electrons in space. The faster a ship goes, the more electrons it plows through. At high speeds, the resulting effect is a measurable mag-

THE ASTONISHING SAGA OF ONE WHO WAS BORN—AND DIED—IN SPACE!

THE MAN WITHOUT A WORLD

A Complete Novelet

By

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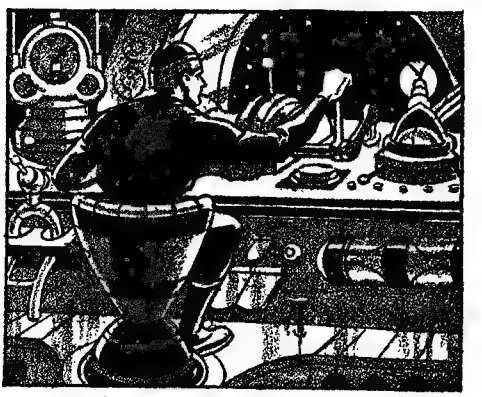


—in the Tenth Anniversary Number of THRILLING WONDER STORIES Next Issue

netic field. In any magnetic field, the sliver of steel in my brain would move —and kill me.

"When you read this, I'll be driving this ship to the limit, building up speed and setting a true course for Earth. The mgnetic field will be building up also. I'll be ready at a moment's notice. At the first twinge of pain in my head—I must receive some warning—I'll get in the airlock and leave the ship. Eventually my body will gravitate into the rocket stream and be burned to ashes.

"I leave the rest to Providence. I'm setting the automatic fuel cut-off for ten hours ahead. The ship will coast for about fifty-five hours. Perry will have come out of his unconscious state by then. He'll have strength and will enough to decelerate, when he realizes it's life or death. He'll land safely.

"I have one request to make—that you men keep my secret. Report me lost on Pluto, body not found—it happens often enough to forestall suspicion. Perry will have made his solo flight unmarred. I think you'll all agree with me that he deserves it. You'll never tell Perry, of course. He'll think he somehow managed to get the ship off himself, though he won't remember how.

"Good-by! With us, the record's the thing. Royce Howe."

THEY were all gathered around the radio, at the outpost, when the report came in from Columbus Space Port seventy-five hours later.

"Here they are—Perry Howe and the *Jules Verne Express,* back from their epochal space flight! A great feat by a great lad! Perry Howe has set the new record of nine days, twenty-three hours and four minutes for a complete circle of the Solar System!"

Perry Howe's blackened, worn face appeared in the television screen. He muttered some conventional phrases for the network. He appeared dazed. Then he raised his voice.

"Roy, I know you're listening, up on Pluto. You should be here with me, sharing the glory. Somehow, you made me go on, when I wanted to quit. You —and the spirit of Verne. This great, crazy crowd should be cheering you, too—" He broke off, swallowed, then went on.

"They're hauling me off to a hospital. Guess I need it. But I'll be up to get you in a couple of weeks, old boy. I'll bring the record-cup along. *You* won it, too!" His face and voice faded from the screen.

In the dome of Pluto's outpost, Jed Alcher's booming voice came as an echo.

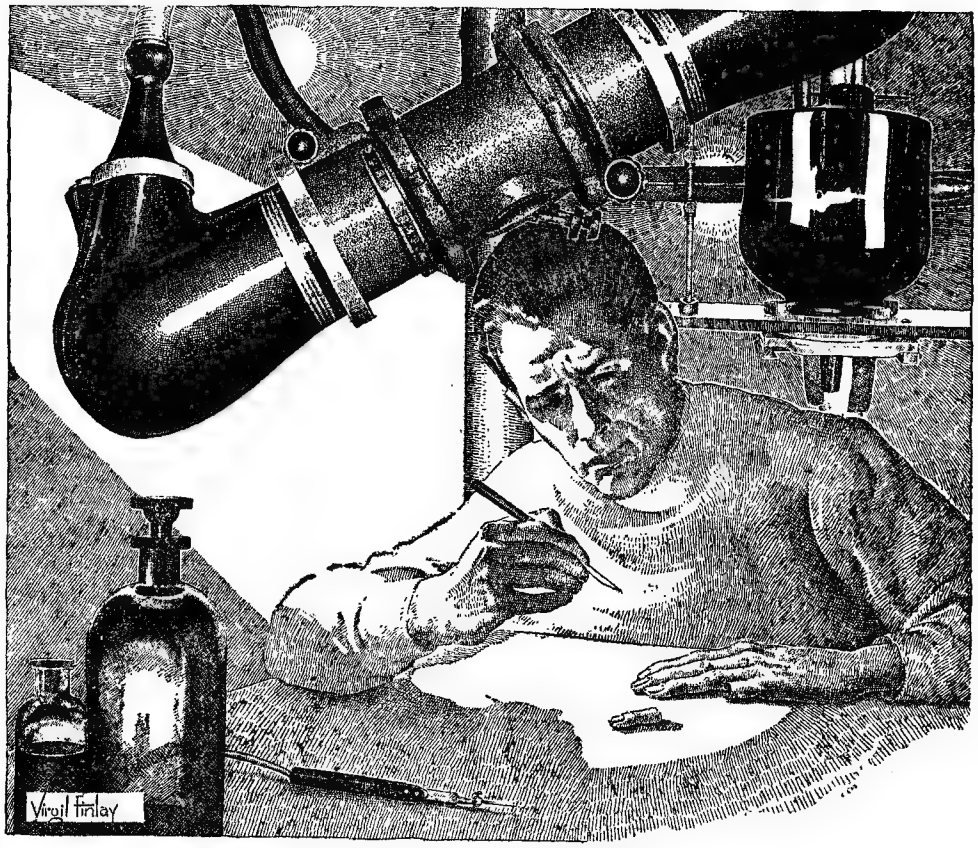
"You're right there, kid! Your brother won it, too." He turned to his companions. "But we'll never tell the kid, will we? We can't let Royce Howe down! He was about the bravest man that ever lived!"

He glared belligerently.

"And I'd like to see anyone here say different!" he added, lest they think he was going soft.

Next Issue: THE ULTIMATE CATALYST, by JOHN TAINE

EXPERIMENT



The knife-point found the joint space neatly—and the finger was off

Strange Research Brings About a Medical Miracle—the Man Whom No Knife Could Destroy!

By ROSCOE CLARK, F. R. C. S.

*JULY SIXTEENTH:** Cut my finger yesterday. Irritating, but not serious. That fool Adams jogged my hand while operating. He's too careless to have around a cancer research outfit. Good with the animals, though.

Working all week on the Webster-Lelong cancer transplants. I like the new rats. Better than the albinos; tougher, easier to handle, and better looking. Not that looks count, but our operative mortality has dropped since the change-over. Maybe the others were too inbred.

The new growth seems to be just what we want. Webster himself is convinced it is a sarcoma, but it shows no evidence of infective element.

The cells are primitive. Unlike ordinary carcinoma or sarcoma cells. The thing is a cancer, though. A suitable starting point for our work with the new 5,000,000 volt X-ray machine.

Strange now to look back a few years. We thought then that a million volts would give us the answer to the cancer problem. 1,000,000 volts across

* Extracts from the Journal of Dr. Henry J. Larrimore.

a vacuum tube — gamma rays — adequate screening — tissue damage restricted — even distribution. Cancer was soon to be one of the curable diseases like tuberculosis or pernicious anaemia. Now we are working with ten times that voltage.

Will the wave-length turn out to be the most important variable? Filtration must be more accurately defined. Detail—detail—relentless detail! Creeping work. A score of minds in half a dozen laboratories creep up on a problem simultaneously and infiltrate, like cancer itself. Then the whole picture becomes clear, and any child can take the credit.

Tomorrow we begin determining the effect of mixed radiations on normal rats. We must find out their tolerance. Then specific harmful effects. Narrow the range—like using a spectroscope, to secure a pure wave-length. Will it prove to be one particular wave-length or a combination? And they talk of the dullness of science.

* * * * *

July Seventeenth: Work has begun. Irradiating whole animals. Narrow it later to affect cell-division only.

Hudson back today. Showed him the new set-up. He liked the Webster-Lelong growth. Glad to find him so interested. We need his steadying influence. Yet, from the start, I have had a hunch that this plant was going to get results.

Parsons looked at my finger today. It had been throbbing a bit, but no sign of sepsis. These surgeons can be strangely disinterested in important things. I've known Parsons since we were in school together. In the ordinary way he is supposed to be painstaking. A brilliant clinician. Apparently, cut fingers are beneath his dignity. One of his internes would have known more about it.

It is my finger, though. I could hardly expect the same interest from an outsider. Wish he had treated me as a case instead of a friend.

Suppose the pathologist sees things from a different viewpoint. I always liked Moynihan's phrase, "the pathology of the living." My own finger an excellent chance for me to study tissue repair. I can never get the boys to appreciate the importance of those elementary processes.

When the knife slipped there was no pain. In the first moment before blood obscured the wound I could see the full extent of the damage. The whole thickness of the skin had been traversed, leaving tiny capillary points of vivid red in the smooth and satiny surface. I had sliced off a section. In that instant I had rapidly reviewed all possibilities. Should I preserve the slice? Obviously useless. Would I have to have one of those small half-thickness grafts? The thing was trivial. Better leave it alone. I applied the usual dressing after cleaning it under running water. Subseqently I could see no reason to have acted differently.

Perhaps I am maligning Parsons. All that I had thought may have passed through his mind even more rapidly. His lack of interest may have been his way of indicating that he thought any monkeying around unnecessary. Was my annoyance merely that of the pathologist deprived of a chance to show off his surgical judgment? Anyway, the wound will heal soon. Granulation will not be excessive. It is the middle finger of my left hand. Sensitivity will not be interferred with. The thing is unimportant.

JULY NINETEENTH: I am badly shaken. Reading the above, I get the idea that even then I suspected something strange. Subsconscious advance knowledge. A sort of mental preview. The last sentence seems now to have almost a frightening import: "The thing is unimportant."

Last night the throbbing ceased, and I removed the bandage. The dressing should have been stuck, but the gauze fell away and, instead of a raw, granulating wound, I saw only a smooth surface of perfect epidermis.

All of which could only be significant to one who had seen the original wound. What had happened was, by all my former standards, simply impossible.

I do not believe in miracles. Immediately I began to think that healing must have been accelerated by the new

rays. A small dose might have reached me in spite of the heavy lead- and platinum-lined glove.

Here accidentally, after all my cynicism, I had stumbled on something of importance. The more I thought of it, the more I became convinced that it should have been anticipated. True, I had not found the positive cure for cancer, but this seemed to offer a method of stimulating wound healing that would revolutionize the whole of surgery. Regeneration at last! My dreams faded into a wildness of speculation the end of which I cannot remember.

This morning I am calmer. Less obsessed with the accident. I must investigate fully. I shall see Parsons first. He alone had seen the wound. Professor Hudson will be interested, though. He has done a lot of work on regeneration in animals. One of his pet theories is that there is no reason why mammals should not be able to regenerate lost parts as the tadpole does a tail or the lobster a claw.

And if all of this is true, how did it happen? Radium and X-ray cancer treatment is based on properties of gamma-rays. With radium, the more solid alpha and beta rays have to be screened off to avoid general tissue destruction. The gamma-rays remain. Essentially similar to the harder X-rays. When the million-volt tube was constructed, radium acquired a rival in ray treatment.

Short electro-magnetic waves "paralyze" dividing cells. The term is descriptive, Hudson's own. Varying tissue sensitivity at least partly explained on the basis of selectivity for dividing cells.

In cancer, cells divide rapidly—also in embryonic tissue. Tumor characteristics depend upon this. Gamma-rays can be employed to prevent the completion of division without necrosis or tissue destruction. Short exposures, the correct intervals, adequate check-up, and so forth.

But suppose the rays overlook individual cell elements? Is there immunity. Do they become more resistant? Second treatments after previous irradiation are often less satisfactory. At times growth seems to be more rapid.

Why not this as the answer to my problem? Stimulation by minimal dosage on normal healing tissues! Worth investigating. I must see Parsons first. Try to overcome his lethargy!

* * * * *

July Twentieth: Am I mad? Or just carried away by this idea of mine? Thought I could be critical, but here are facts I can swear to. All of Parsons' pooh-poohing can't make me unsee what my own eyes have seen. I expected more respect for my powers of observation.

The devil of it is that he's my only witness. Perhaps I am making the issue too personal. But it's my finger. And it healed up just about three times as fast as it had any right to.

Only possible explanation is the rays. Why not? It wouldn't be the most fantastic discovery of the past fifty years.

Meanwhile, I have other work. Must pull myself together. Parsons' attitude gets me down more than the actual occurrence.

July Twenty-second: Got Hudson in on my story after all. Concealed my anxiety and told him the tale without any theorizing. He marveled at my finger and, after a little reflection, reached the same conclusions I had. We continued the discussion abstractly and planned experimental work on monkeys. We already have the detail of their rates of healing. A crucial test should not be difficult. That is, if the effect is a general one.

If there is a limited wave-length range, it will take longer. We can but try. I am less disturbed since the chat. Must try to forget the personal slant. Have to check up on possible leakage through the gloves. May get a clue to dosage.

July Twenty-fourth: Must be getting neurotic. Tingling sensations up my arm from the finger. No pain, but distracting.

The sarcoma grafts are taking well. The rats are remarkably resistant to the new rays. Stand much larger dose than with the old 1,000,000 volt tube. We don't know why.

AUGUST THIRTIETH: Experiments progressing. Rays even more harmless to life than we thought

at first. Now irradiating the rats with the new tumor. No results yet.

Nor from the monkeys. As yet only the mixed rays used. Healing, if anything, delayed by the larger doses. Only to be expected. Meanwhile, I grow more conscious of the finger I injured.

Difficult to describe accurately. Increased consciousness. Not ordinary hyperaesthesia of the nerve injury type. Superficial sensation unchanged. But all the time I know that something is there.

Pure imagination? A subjective obsession neurosis? My desire for fame making itself apparent through the idea that started from the injury? I can talk myself out of it, but am convinced there is an organic change. The rays have done something. I must find out what.

September Fourteenth: Still nothing from the monkeys. Yet, more than ever, I am sure something has happened. No external changes. Not even the old radium cancers which usually followed burns. I feel we are on the verge of something big. I am not mad.

* * * * *

September Fifteenth: Perhaps I am mad.

Today I plucked up courage to repeat my accident. Wanted to for weeks. Now it is done. I should not have believed it so difficult to cut one's own finger deliberately. Gave myself a local. Infiltration of skin with novocaine. Removed an adequate slice. Tomorrow I shall repeat the exposure to the rays, wearing the same gloves.

All this I am keeping to myself. I do not relish any more of the Parsonian brand of sarcasm.

September Seventeenth: Success. This time I watched it. It healed from the depths! The epithelium did not grow in from the periphery. Am I using my imagination too much? Photographs next time. I must have my data complete before announcing the discovery. Let them play with their rats and monkeys. I shall work on myself.

September Nineteenth: The strange sensations have increased. The "awareness" has spread to my hand and up the arm. X-rays on the nerves? Cut nerves do produce poor circulation and trophic ulcers. Could the rays exaggerate the trophic effect and so accelerate healing?

Direct action on cells, more likely. Which cells? Repairing fibroblasts from the wandering cells of the blood? No other evidence of effect of X-rays on these. Why did the monkey experiments fail? Have they failed? I must worry this out.

SEPTEMBER TWENTY-FIRST: Hudson saw me today. Told me I looked ill. Suggested I'd been working too hard. Didn't mention the finger episode. Has he forgotten? Does he know what is getting me down? I ought to lay off, but the thing is obsessing me. I must pursue my experiments. Not a small wound this time. An amputation? That would be worth while.

September Twenty-fourth: When I first got the idea I did not think I could carry it out. But I have. Unpleasant, crude surgery. Ring infiltration with local at the base of the finger. Working in the lab difficult. Aseptic technique very sketchy. We sometimes laugh at the squeamishness of the "real surgeons." One day we'll destroy all the germs. That'll make them mad.

Now I don't feel very happy about it, but at the time all went well. I got Adams to put the tourniquet on. Then he left me without suspecting the truth.

The skin cut was bold. Painless, but strangely satisfying. No bleeding. The knife point found the joint space neatly, and the finger was off—the terminal phalanx rather. I almost enjoyed the foolhardiness of it. Tying off the lateral arteries more difficult. Somehow my fingers got the catgut tight. The skin sutures were a little easier. Did not want them too tight.

I got a large pad over the stump. Then called for Adams to bandage it. He is used to my oddities but I did not want him to see the finger tip. Had to get rid of it quickly, so threw it into the incinerator. I wish now I had kept it.

When I got home I collapsed. After a few drinks, staggered to bed. This morning I went to the lab. Surreptitiously I got the necessary exposure to the rays. Here I am waiting. Waiting

for this fantastic idea to be disproved. God, what a fool I am!

September Twenty-sixth: Two days ago I thought that either the miracle would happen or I would go mad. Now it is happening, and I think I am going mad as well.

The finger is growing. After the operation, the wound began to throb. That subsided. Yesterday I looked at the wound. There had been little bleeding but the whole stump was bulging. Stitches tight and beginning to cut. Painful getting them out.

The space between the partly approximated edges was filled with clot; did not then look remarkable.

This morning I looked again. The clot has dried and separated. The stump had grown. The original skin edges had begun to turn gray, but in the gap appeared the beginning of the new pulp, pushing up like a budding plant.

Fascinatingly strange was this new pathological process I was witnessing. Stranger still that it should be observed for the first time in the history of the human race by someone who, as well as seeing the outward changes, could understand what was taking place beneath the surface.

Only when I begin to look for fuller explanation does the real novelty, almost the horror of its very unreality, begin to make itself felt. Can the change be repeated at will? Is the thing destined to become a commonplace? If a finger, why not a leg? An arm? Even the internal organs? The whole body? Potential immortality!

As yet nothing clear. It is all a torment. All I know is that if I am going mad it is not for nothing. It did happen to me. They cannot deny me that.

* * * * *

September Twenty-eighth: The miracle is completed. This morning for the first time I am calm about it. I fear now that I shall wake. Sometimes wish that I could, yet know I shall not. This is no dream.

The completeness of the regeneration is not, I suppose, so remarkable unless one tries to picture the controlling mechanism: the regrowth of a whole bone; the formation of a joint with its capsule, cartilages, and synovial membrane; the reconstruction of a nail matrix and a nail—all that in only a tiny fraction of the time required for nail regeneration alone after removal under ordinary circumstances. Further, the skin has developed from the depths of the wound; the epithelium is not from old epithelium, but from some other tissue! What can it mean?

Yet, this is no more complex than the development of the embryo. Same unsolved mysteries involved. I must plan experiments to discover how the process works. I am still convinced that the new rays are the sole extraneous factor.

In moments of distraction I have pictured myself cut off at the neck and growing a new body. This afternoon I must get out of the house. Yet still I have no proof. I think I shall go away as Hudson suggested. I must think. The future is crowding on me.

October Third: So far I have told no one, done nothing. I am calmer, less excited, less obsessed with the strangeness. I have begun to take an interest in the old work. Perhaps, after all, it was only a dream. Wish I had kept that finger. Might have told something of the inner story.

OCTOBER FOURTH: Sensations are spreading. Have reached the elbow and are still moving upward. This morning there was a pain along the radial nerve. I must do something to prove this thing to the rest of them. Bold and final. If only I could cut the whole arm off. The idea does not frighten me, but I can't see how to do it myself. Dare not try to persuade anyone else. Men have removed their own appendices, but an amputation is different—and without assistance, impossible.

October Eleventh: Awoke today in the Rodney private hospital under the care of Dr. Parsons. All trussed up—and minus my left arm.

Memory pretty hazy. Seem to recall it was raining, and that I slipped in crossing the street. Tried to roll away from the trolley car. Nothing more.

So my subconscious has succeeded in trapping me. I'd been trying to devise a way to get the arm smashed up sufficiently. In full possession of my faculties I don't see how I could have

carried it through.

It was not deliberate, but certainly successful. Now I must wait for things to happen. Keep a grip on myself. After all, this is what I wanted. No use running away from reality.

They have taken it off above the elbow. So much the better. I am confident my arm will grow again. Dare not contemplate the other alternative.

Tomorrow I shall know. Even now it begins to feel tight. I wonder how Parsons will take it. And when it has grown again, what then?

October Twelfth: So the great man isn't coming in today! Sent his junior. That I regard as the final insult. Fortunately young Rawlins didn't want to look at the stump.

I must get Parsons down. Tonight perhaps I shall complain of a lot of pain. When they see the amount of swelling, Parsons will have to come to remove the stitches. Then we shall see.

Wish I had the arm. Next time the severed member shall be preserved, embalmed if necessary. That surely is only fair. It was my arm. No reason not to let me have it just because I'm going to grow another.

When will I dare try it on a leg? Somehow I feel that the spread of the sensory disturbances is related to the capacity for repair.

My God, though, why should the thing heal itself? No exposure to the rays since the accident. What an intolerable fool I am! How can I get out of this? I guess I'm strong enough to walk. Parsons wouldn't come down. I cannot stay here. I must get to the rays! To hell with them all.

LATER: after a fight with the whole administration I got away. They all think me mad, but what of it? Parsons couldn't come and Rawlins would not take the responsibility so I quit. Must get to the plant tomorrow. Even that may be too late. Tonight would be better. But how can I get the machine working? Perhaps the technicians are working late. I'll get right over.

October Thirteenth: Back in hospital. Wish I could remember what happened. Think they are keeping me by force now. I got into the building last night, but not into the lab. Must have gone haywire after that. I dimly remember fighting.

How I hate it all. Strange, this sudden hostility. Until now I have been fascinated by the importance of the discovery. Now I can only think of it as something horrible. I'm too introspective, perhaps. Wish someone would come to see me. Suppose they think I'm mad, and have barred visitors. Not that I deserve any after avoiding everyone like the plague for the last three months.

* * * * *

October Fourteenth: Trouble has started. Parsons came in this morning. Still treating me like a small child. Ignored all requests for information. There had been very little pain, but I knew the stump was much swollen. Most of the stitches had already parted. He took out the rest and began for the first time to show signs of interest. As he gently turned back the edges of the skin-flaps his expression changed. Obviously he was bewildered. I could hardly restrain myself from a cry of triumph.

He gazed more intently at the wound then turned to me as though wondering if I was old enough to discuss the thing at all. Finally he replaced the dressings and left the room without a word.

Meanwhile the strange sensations have spread. Across my chest and down towards the abdomen. Also up the back of my neck. I suppose lying in bed makes one more aware of any slight disturbances of cutaneous sensibility.

So the rays weren't necessary this time! That alters everything. Have the rays already done their work on me? Produced some change that is spreading, and with it this amazing capacity for regeneration. Spreading from the arm to the rest of the body!

Later: The whole gang came back —Parsons, Professor Hudson, Rawlins, and Weatherby, the interne. They all looked at the arm and took no notice of me. When I said anything they tried to soothe me with utter nonsense about it "doing well."

Finally they suggested a bioscopy. Reasonable, I suppose. What do they expect to discover from a segment of

the stump? Why aren't they more amazed at what was occurring under their eyes? Why the hell can't they tell me? I'm pretty feeble, but this waiting will drive me crazy.

OCTOBER FIFTEENTH: I must think this whole thing out again. What has happened to me to give the power of regeneration? What did we know before? Skin, epithelium rather, regenerates from epithelium; bone from the osteoblasts; muscle from muscle, but only to form fibrous tissue; and blood from the bone-marrow, constantly. Glands hypertrophy when necessary. Same process, different response. No. The adenomatous thyroid, toxic type, regrows and the regenerated part functions. Arteries regrow from connective tissue cells, as does fibrous tissue itself. These we know about. What is different here?

Epithelium reborn from the depths of a wound. Bones reconstructed in their entirety. Two of the three germ layers regenerated from the same region. Toti-potential cells. Like those of the dermoid cysts, that grow bone and teeth and hair and skin and pancreas and spleen all jumbled up together in one useless mass. Tissue gone wild!

Can the rays make the cells of the body revert to a more primitive, less specialized type? Or could they act on cell-rests?

The dermoids, those strange half-separated monsters, the gruesome two-headed embryos in the museums, children with extra legs, adult tumors that take the form of an arm, a leg, or an ear—all these supposed to originate in cell-rests. Cells bud off early in embryonic development before the germ layers separate, then lie dormant. What we do not know is why they start to grow. If you like, why they stop growing.

Is this the explanation? Something in the new rays that individuals with such rests can become exposed to accidentally under ordinary circumstances? Have I received in unusual intensity the unknown factor that has given, in addition, this power of restraint, of being able to build up only what had been lost? I must elaborate. At least there is a plausible theory here.

October Sixteenth: Turned the tables on them today. Now they think they're mad. Today it looked less like a tumor and more like what it is going to be—an arm. As soon as they saw the uncovered stump they began asking questions. I gave them this journal. A strange dramatic tension in the room while they read it. Then they apologized whole-heartedly, even Parsons.

Tomorrow the microscopic sections will be finished. That may help. Hudson refused to express an opinion. Agreed it was most unusual. Parsons favored my idea of the cell-rest theory, a sort of restrained teratoma. He obviously does not believe that it will grow a hand. I expect him to advise amputation and an intense course of the older radiations. They have all promised to keep the whole affair secret. Tonight I feel almost human again.

October Eighteenth: I now have a wrist. Occasional tinglings, but otherwise I have been cheerful. My depression has gone. Hudson was in. Had not seen the sections, but asked a lot of questions the others overlooked. I think he has an idea of his own that he is not yet ready to share.

* * * * *

October Nineteenth: They are keeping something from me. I think they are lying about the sections not being ready. These damned nurses have obviously been told to be politely uninformative. They took another specimen this morning. To hell with research! I hope I shall still be able to fish when my hand has regrown.

November Fifteenth: What can have happened? They tell me I jumped from the window and fell four stories. A post ripped my abdomen. Both ankles were fractured, three ribs cracked, and later they had to remove my spleen and left kidney. I had begun to bleed internally.

A hell of a mess, none of which I can remember at all. Yet here I am feeling, under the circumstances, remarkably fit. The abdominal wound can hardly be seen, and the fractures are healing rapidly. Three weeks of amnesia, and they tell me I have said nothing. I don't believe them. They are watching me. Waiting to read these notes I ex-

pect. What of it? What do I care?

So I tried to kill myself. Why? And failed dismally. Am I immortal? A serious thought. If repair is perfect, life will be prolonged indefinitely. Is that the fate of this twentieth-century pathologist? To discover through cold science the answer to the prayers of all the romantics of the ages?

Yet when one thinks of it, there is something distasteful about the idea. Better to have no time to finish all the things one would have liked to have done, than to have so much time that one would never bother to begin them.

I am still weak. Even these notes have tired me out. I feel drowsy. They are probably keeping me doped.

NOVEMBER SIXTEENTH: A series of X-ray pictures today. My kidney has regenerated and is functioning. Well, why not? It's only epithelium. Not really more specialized than the skin. Are there functional kidney tumors?

One thing I had forgotten. Nervous tissue, the brain cells as opposed to the fibres, does not regenerate under any known conditions—does not even form true tumors. Will that save me from immortality?

Something happened to blot out my memory. Yet they say I was not concussed. Did I discover something before I jumped? Why did I jump?

November Seventeenth: I have found it. Explanation at last. And of my own madness too. This will be the last entry. This time I shall not fail. I must die!

Toti-potential, primitive, cancerlike cells! How did I miss out on that? How did the others? Or is that what they have been keeping from me? Now I know why I tried to destroy myself. The thing is too horrible. Subconsciously I must have been aware of the horror all along.

Obsessed by the rays and by them alone, even when I thought of the cell-rest theory, I ignored the obvious lead. Even then my subconscious must have been taking control; must have established an inhibition lest I discover the true nature of my affliction.

I cut myself, transplating the new culture from that rat to me, and the thing spread. Primitive cells with the power of differentiation under certain conditions of the new 5,000,000-volt ray. That strange new product of the Webster-Lelong laboratory! All along I had overlooked the possibility of a transplant to myself from that fateful knife. Where now would it end? Already the nerves of my arm have regenerated; why not my brain? Was it not already being infiltrated by the foreign cells left behind in the wound when I first cut myself?

They have barred the windows, but that shall not stop me. It will soon be over now. I am too much a sentimentalist to be the cold-blooded scientist to carry this through, too fascinated to draw back. I am too human to go on living, knowing that I am gradually becoming a living cancer—the cancer of a rat.

Next Issue: NO MORE FRICTION, by Dr. David H. Keller

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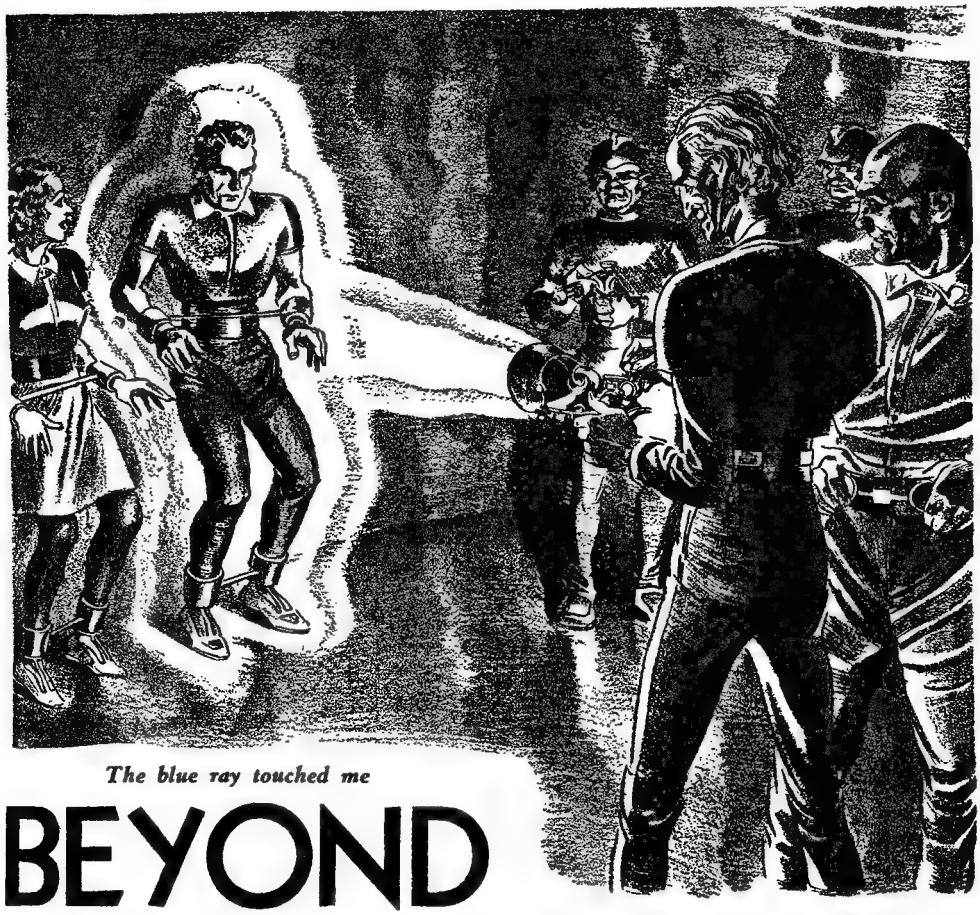

The blue ray touched me

BEYOND ANNIHILATION

By HENRY KUTTNER

Author of "Power of the Snake," "The Devil Rides," etc.

WHEN I heard the footsteps pause at my cell door, I knew that my month-long imprisonment beneath Administration House was over at last. The realization brought me no elation. I knew too well the fate of prisoners in the "guinea-pig" gallery—human specimens, reserved for scientific experimentation.

As the door slid noiselessly into the opaque glassite wall I saw Orsa, my jailer, flanked by two guards. His red-lidded eyes were blinking rapidly, a trick of his whenever he was inordinately pleased.

"Come out, Falcon," he said softly. "Degg wants to clip your wings."

Degg was a renegade scientist, vassal of Marlin, the overlord who had overthrown the government and seized the reins of power on that fateful day of March 4th, 2203 A.D., only a few

months ago. And Marlin's legions, armed with new and powerful weapons of destruction perfected by Degg, had scattered my fleet of air pirates and made me, Paul Dent, the Falcon, a captive.

As I came out of the room blazing agony raced through my arm, and I swung about angrily. Orsa's heavy-jawed face was twisted in a grin, and the muzzle of the electrogun in his hand glowed redly. This wasn't the first time he'd tried such a trick. My body bore more than one scar attributable to Orsa.

Orsa barked a command. The guards hustled me the length of the corridor, into an elevator, and along another passage to a bare, metal-lined chamber, obviously an experimental laboratory. The walls were splashed with rusty stains and discolorations; manacled to one of them was a girl.

From televisor portraits I had seen I recognized her as Jan Kenworthy, daughter of President Kenworthy, whom Marlin had killed in his *coup d'etat.* There was the bronze hair, falling in soft ringlets to her leather-uniformed shoulders, the level blue gaze, the stubborn little chin. She knew me, too, I saw, but after a brief glance paid me no attention.

TWO men were in the room: Degg and Marlin. Marlin was strongly-built, bull-throated, with an unruly thatch of stiff, red hair. Degg's hair was silver; he was thin and hollow-cheeked and feral-eyed. In his hand was a curiously-constructed weapon with a bell-shaped muzzle.

"Good-by, Falcon," Orsa called. "Remember me!"

Suddenly I went limp, sagging laxly against the arms that held me. As I had expected, the grip loosened momentarily, and I wrenched free, whirling and leaping away. Fear sprang into Orsa's red-lidded eyes, and he thrust up a warding arm. My first brushed it aside and smashed home against his heavy jaw.

By Algol, it was good to feel the bone splintering beneath my knuckles! Smiling, I let the guards take me. As they pulled me toward the far wall I saw a curious light in Jan Kenworthy's blue eyes.

Marlin was bellowing laughter. "So the Falcon can still strike, eh?" he roared. "A good blow, Dent! A good blow!"

They chained me to the wall near the girl. The guards were alert now, their electroguns in their hands.

As the groaning Orsa went out, Marlin eyed me, rubbing his chin.

"I'm sorry you've got to go, Dent," he said in his gruff voice. "I'd like to have you on my side. But I don't dare have anybody around that I can't handle."

"Thanks for the compliment," I said. "What about Jan Kenworthy here? Why kill her?"

The girl turned her face toward me.

"I need no air pirate to defend me!" she said hotly. I felt blood creeping up to my face.

"You see, Falcon?" Marlin said. "I can't free her. She'd rouse the country against me in a week. No, you're both dangerous—and Degg will deal with you."

The lean scientist had been fumbling impatiently with his curious weapon. "Good," he said. "This will be the final test. I've tried it on inanimate objects, and cats and dogs. Now I'll use it for the purpose for which it was designed. With this in our hands there'll be no chance of revolt."

I eyed the strange gun, vividly imprinting on my mind the miniature coils and oscillators clustering about its barrel.

"I've not seen those experiments," Marlin said. "You say it's a—a vibrator?"

Degg grunted. "Marlin, you're no scientist, but at least you know what vibration is. You know that everything vibrates — solids, liquids, gases — at a certain fixed rate; that the atoms in your body are vibrating at this moment. You've seen objects vibrate rapidly, and noticed how they seem to blur—to become partially invisible. That's unitary vibration—vibration of the whole. It's incomplete. I've completed my process by developing a ray that'll increase atomic vibration."

"I see." Marlin's brow furrowed.

"Look here," Degg continued. "Suppose the atomic vibration of your body is a thousand times a second—an arbitrary number, that is. I increase it, double it. What happens?"

I FELT a little shudder crawl down my back. I knew my fate now.

"You'd be annihilated," Degg finished flatly. "I've proved it You've not seen the preliminary experiments, Marlin, but look at this!"

He leveled the weapon at a chromium-metal chair. There was an almost inaudible hissing and a beam of ghastly bluish radiance crawled out from the bell-shaped muzzle. It fingered out, slowly, until it touched the chair. The azure light crept over the metal's surface. The chromium shimmered, a play of dancing radiance flickering over it. For a moment the chair was bathed in cold blue light.

Suddenly it hurt my eyes to look at it. The chromium seemed to be shaking—not the chair, but the atoms of the metal seemed to dissolve. Even as I watched the chair vanished!

Involuntary exclamations of fear and awe burst from the guards' lips. Marlin's breath came explosively.

"God, Degg! I hadn't realized—what a weapon that is!"

A dry smile twitched the scientist's colorless lips. "It isn't perfected yet. This is the only specimen. It takes some time to manufacture them at present, but later we'll make improvements. Shall we complete the test now?"

Marlin's face was no longer ruddy. He nodded. "All right, Degg. Get it over."

Still smiling, Degg lifted the weapon. The beam sprang out straight for me. Oddly I could see it creeping forward. It didn't behave like ordinary light.

The blue ray touched me.

My muscles jerked convulsively. I saw the room through a flickering azure curtain. A strange shock went through every atom of my being, not painful, but—unexpected. The room flashed out and vanished in a curtain of darkness.

Grinding, shaking metamorphosis, akin, perhaps, to death . . . flight through blackness . . .

And the dark curtain seemed to shimmer, to flow back. Grey light crept in. For a moment the landscape shook and wavered unsubstantially; then it steadied. I stood silent with amazement.

Degg's laboratory—was gone! Gone the intent faces of Marlin and the scientist, the white face of Jan Kenworthy, the frightened faces of the two guards. My chains had vanished. I was in another world!

Thick grey fog hemmed me in. It seemed to possess some menace. Yet there was nothing tangible. Merely the sensation of unseen eyes watching—and the abnormally dense fog.

Crystalline rock slabs comprised the ground beneath my feet. Greyish, rounded stones lay half embedded in the crystal here and there. Surprisingly, a few feet away was a chair.

A chromium-metal chair. And I had last seen it bathed in the blue glow of Degg's weapon!

Abruptly a little shimmering light sprang out in empty air beside me. Wonder flooded me as a colorless shadow leaped into existence—the slender shadow of a girl. Then, quite suddenly, I understood what had happened.

The shadow grew thick. It became three-dimensional; real. It was Jan Kenworthy, her eyes wide, staring at me in bewilderment.

I moved closer, took her hands in mine. The touch of warm, living flesh reassured her. She clung to me for a moment; then her glance swept around this strange world of grey mist.

"DON'T be frightened," I said. "We're still alive. Degg's guess was wrong."

She shivered. Then she drew away from me, eyeing the chair. I smiled.

"Sit down. Go ahead; make sure it's real. It was thoughtful of Degg to provide the chair for us."

She sank down gratefully. I didn't know how long she had been standing chained to the wall in Degg's laboratory.

"Falcon," she said, "we're not annihilated." As though she couldn't believe it.

"Degg saw his subjects vanish as

their vibration was speeded up," I told her. "And it's quite true that they were annihilated—from Degg's viewpoint. But what's to prevent another world, coexistent with our earth, lying on the same space-plane but separated by a difference in vibration?"

She frowned. "I don't quite—"

"Well, a world whose atoms vibrate much faster than earthly atoms—the world we're in now, apparently. Invisible to earthly eyes, just as a tuning-fork is partially invisible when it's vibrating. The theory isn't new. Degg simply increased our vibration-rate, and enabled us to perceive this world."

"But—it's the end, isn't it? We can't get back."

I shrugged. Abruptly there was a movement near by. Something small and dark was approaching through the fog. I reached down to pick up one of the stones that dotted the crystalline soil.

Involuntarily a surprised oath was jerked from me. My fingers sank into the rock, sank into soft grey pulp that clung to my fingers. Camouflage! Plants or fungi masquerading as stones!

I stood up to face the visitor. But Jan had already recognized it.

"It's a cat," she said. "But how it got here—"

"Don't you remember Degg's other experiments?" I asked. "He tried out his weapon on dogs and cats. Probably there'll be a lot of them around here."

The cat came closer. The fog above it seemed to thicken. I'd flown blind through many a fog, but never one like that. Jan got up quickly, caught her breath in a little gasp of horror.

The fog around the cat was cottony, viscid—half solid. It writhed inward. The cat paused, looked up—and was engulfed.

The cat's harsh, grating scream ripped out horribly. Through whirling fog I saw the little creature lifted, and the greyness closed in—hungrily. Little crimson drops spattered.

Jan was very white. "Falcon," she whispered, what sort of world is this? Maybe it would have been better if Degg had had his way."

"Don't say that, Jan," I said, tonelessly. "We're still alive—"

"But for how long?"

I had no answer. I picked up the metal chair. It was a light but serviceable weapon.

"We'd better stay here till the fog lifts," I told the girl.

"Will it lift?" she said. "That's not ordinary fog."

It wasn't. It reminded me horribly of amoebas I'd seen under microscopes. Half-solid, capable of coalescing to capture its victims and devour them.

"The chair and the cat were the only earthly things waiting for us," I said, after awhile. "Degg must have used his blue ray on plenty of other things. What happened to them?"

"This fog-thing may have—" She didn't finish.

"I doubt it. Living things, yes. But not indigestible objects." I broke off, sorry I had spoken.

WE had been in a little circle clear of the strange fog. Now it was narrowing, the greyness closing in.

The fog seemed to rush in and overwhelm us, choking us with its thick greasiness. It was like being engulfed by a giant amoeba, feeling moist tendrils and folds pressing down with fearful force. My chair whirled through the air. But it was like battling under water; and ever the horrible thing pressed heavier and heavier upon us.

I was almost lifted from my feet once by a dank fold of gelatinous stuff that wrapped itself about me. I heard Jan cry out, and caught her about the waist just in time to prevent her from being swept away.

It was a hopeless battle. Yet I fought on, bitterly, vainly, until I saw a great black bulk floating down toward me through the murk. Was this new menace the nucleus of the fog-monster?

Light came; cold, white, vivid radiance. The bulk came to a stop not three feet away. It was an airship.

Not an earthly airship. It was like a conical bullet, tapered and rounded at both ends, twenty feet high and twice as long. From a circular port the cold light streamed out.

Hope came suddenly, and somehow I battled my way across that three feet of grey, coiling death. I stumbled over a metal threshold, dragging Jan with me. We collapsed on the floor of a small cubicle, while a door clanged shut behind us, shutting out the grey cloudy billows.

Jan was scrubbing weakly at an odorless, greasy-looking slime that covered her. I, too, was smeared from head to foot.

"Quite a world," I said, with a feeble grin. She tried to smile, glanced up quickly at a quiet rustling sound.

Another door had opened. A figure was standing in the portal. I stared in amazement.

He was man-shaped—but not human. A scanty harness of some kind of leather comprised his clothing, permitting a view of the amazing structure of his body. He was translucent!

Light shone through his body! Like cloudy glass, his flesh glowed milky and semi-transparent, and within his body—like an X-ray photograph—I could trace the glowing outlines of unfamiliar-looking organs.

A curious phenomenon puzzled me. There was a heart, although an abnormally large one, and other organs clearly discernible, but apparently there were no bones, or else they were quite transparent.

His face was masklike, rigid and whitely translucent. He was hairless; his eyes were large and black. His jaws seemed hinged like mandibles, the only part of his face, I was to learn, that ever moved. His face was without muscles, covered with a chitinous translucent exoskeleton.

HE said something in a language that was all vowels. I shook my head, and he beckoned.

"Come on, Jan," I said. "He seems friendly, although he looks like a a freak."

"I be not freak," the translucent man said. He said it in English!

Jan and I stared at each other. "You speak English?" I got out rather shapily.

He nodded. "Yes. Enter."

Questions teeming in my mind, I followed him into what was probably the control room, a room obviously furnished for utility only. A few stools and chairs, a table or two, a metal-mesh hammock dangling from the ceiling, some paraphernalia in a corner, and an instrument panel set in the wall.

The translucent man pointed to chairs.

"Hello—sit down," he said, accenting the words wrongly. "How is it that you speak English?" I said.

He picked up two books from a table and held them out to me. A scientific textbook and a popular novel. Then I saw the heterogenous collection in the corner and realized the truth. There were several chromium chairs, some small blocks of stone, specimens of metals and fabrics, familiar earthly things.

"Jan," I said. "Degg tried his blue ray on these books, among other things, and our friend here found them. He's learned English from them."

"My name be Ruug," our host said. He waited expectantly, and I introduced Jan and myself, with a mad feeling of unreality.

"The man must have a remarkable brain!" I said to Jan.

Ruug stared at me uncomprehendingly. "Brain machine," he said. "You wonder many things. I shall tell you."

He went on in a flat, emotionless, mechanical voice. I will not attempt to reproduce his curious phrases, his garbled English, but it was a fantastic history I learned. This was a world utterly alien to ours. Evolution had created here an anthropoid ruling race, although it differed from the human race in many particulars. Ruug was the last of his kind.

Ages ago Ruug's race had developed an exoskeleton—a shell outside the body, like earthly crustacea, instead of the human endoskeleton. In time this shell had softened, sloughed off, and become unnecessary as the body beneath it had become a mass of tough gristle and tendon.

Ruug was actually boneless; he needed no skeleton, for his flesh was incredibly hard; akin, I think, to the tough human heart-muscle fibers. His mind was, as he had said, a brain

machine. Through the eons emotion had been bred out, leaving a highly trained machine of flesh and blood.

He wasn't a super-scientific genius, but he was practically a mechanical thinking machine. With two books in his hands, he had been able to learn our language, even approximating the correct pronunciation. He was a human robot—a *thinking* robot.

He spoke of the fog-thing we had encountered. It was, as I had guessed, a living entity. It had come, Ruug thought, from space.

A hundred years ago this world had been thickly populated with beings like Ruug. Then the fog-creature had come, Cyclopean, terrible—and hungry. Life had been wiped out.

A few survivors had fled to underground retreats, or to airships like this. But one by one they had died, until Ruug was the last survivor. Nor could he escape, for his race had not conquered space travel.

I glanced at Jan and realized that she was asleep. I turned to awaken her.

"Let her be," Ruug said. "I made her thus. Purposely." He pointed to a tiny orifice in the wall beside her head. "A sleep gas I released. She will awaken not long."

He read the anger in my face, put up a restraining hand. "Wait. I saw enmity in her eyes. We can help each other, I think. But she would cause trouble."

Resentment was rising within me, but I fought it down. After all, this man had saved our lives.

"Well?" I said.

"First tell me what happened to you."

I gave him my story. He sat there motionless, his huge black eyes brooding. When I had finished he spoke again, and I was surprised at his increased fluency. That amazing machine-mind of his had learned much from listening to my narrative.

"It is as I supposed," he said. "A vibration world. When I first found those objects—he pointed to the pile in the corner—"I suspected something of the truth. So I kept watch in this spot. Your science-man should have guessed. There are not only two, but innumerable worlds, different in vibration, lying on the same plane. By increasing or decreasing one's vibration rate it is possible to move from one of these worlds to another."

"You're able to do this?"

"Not yet. One advantage of your type of brain, swayed by emotion, is that you have imagination, which I have not. Given the factors of an equation I can accurately compute the solution. But the initial step—there I am handicapped."

Hope faded. "Then there's nothing —"

"Wait. You have given me the factors of the equation. I want to leave this world. So do you. We can do it in the same manner in which Degg sent you here—by vibration. Will you picture again exactly what happened in your earthly laboratory and describe the weapon which projected the blue ray?"

I EXPLAINED Degg's weapon as well as I was able.

At last Ruug nodded.

"It is well. There are not many factors, but I can find the missing ones. We shall go to your world—" He paused, eyeing me. "Degg and the other—Marlin—would destroy you, would they not? And me also they would ill. They must go. That will leave your world without a ruler." The great black eyes were glowing. "Shall we rule it ourselves?"

There was a sound behind me. Jan was on her feet facing us as I swung about. "I heard what you're planning, Falcon!" she blazed. "You don't intend to—"

Ruug's chitin-masked face was expressionless. "Well, why not?" I said.

Her lips were a white line. "You'd give Earth to this creature? You—a human being?"

"What has earth done for me—a hunted outlaw with a price on his head?"

"No one drove you to become a pirate."

I felt myself flushing. "Well, I am a pirate. To the devil with Earth!"

"You swine!" Jan's eyes were wet. "You—"

I TURNED to Ruug. "Can you put her to sleep again?"

Swiftly he touched a button set in the wall. Abruptly the light went from Jan's eyes. I caught her as she fell.

"You've not hurt her?" I asked Ruug, my voice uneven.

He shook his head. "Asleep. She'll wake after a time. Put her down in this hammock. You, too, had better sleep for awhile. I will need your help presently, perhaps, and wake you then."

He touched the wall; another hammock dropped from the ceiling. I put Jan's limp form into it and climbed into the other one myself. A little breath of sweet-smelling perfume brushed my face—and I was asleep. . . .

* * * *

"It is ready."

Ruug's hand was on my shoulder, shaking me. I blinked, climbed out of the hammock. Ruug gestured.

"I did not need your help. The equation was not too difficult."

A square block stood near by. But only the square floor-platform was of solid metal; the sides and top were a grille of fine-meshed wire. There was an oblong opening in the side facing me. The platform was perhaps fifteen feet square. A lever protruded from the floor in one corner. That was all.

"An improvement," Ruug said, "over Degg's device."

"This will take us back to our world?" I asked.

He nodded, said, "Come."

"Wait," I said. "Jan—the girl."

"Leave her here."

Our eyes clashed. "She's going with me," I said.

I lifted Jan's unconscious form, carried her into the cage, put her down gently. Ruug handed me a tube that looked like an old-fashioned Twentieth Century flashlight.

"It kills by destroying the nerve tistues," he said. "Simply squeeze the sides."

He held one of the tubes in a translucent, glassy hand as he moved to the lever, swung it over. The mesh walls of the cage began to glow with a soft blue radiance. I felt a tingling go through me.

Blackness . . . shuddering, unstable void. . . .

Light came again. Through the mesh of the cage I saw that the walls of Ruug's ship were no longer around us. Instead there were the stained metal walls of Degg's laboratory.

A man was chained where I had stood hours before. A dozen guards stood rigidly at attention. Degg was lifting his vibration weapon.

I shouted, leaped out of the cage, Ruug at my heels. Their backs were turned to me, but Falcon had never killed an unwarned enemy.

I leveled my ray-tube, snapped, "Lift 'em! Quick!"

Before either the guards or Degg could move a blinding beam of white brilliance flashed over my shoulder. I dared not turn to strike down Ruug's weapon, with the guards swinging to face me.

They died. Bathed in Ruug's white ray, they slumped like bags of meal and dropped, their nerve tissues burned out by the dreadful power of the beam. Degg had leaped aside, his vibrator weapon leved at me. The blue beam fingered out from the bell-shaped muzzle while amazement still contorted his gaunt face.

RUGG'S white ray caught him. He fell. His face went blank, and his weapon clattered to the floor, exploding with a hiss of burned-out wires.

The white ray clicked out. "There remains the other—Marlin," Ruug said.

"Damn you!" I cried hoarsely. "You gave them no chance!"

He looked at me blankly. Before he could speak Jan appeared in the door of the cage. There was loathing on her face.

"You butcher—Falcon!" She spat out at me.

Ruug kicked at the smoking remnants of Degg's weapon. "It is destroyed," he said tonelessly. "You said it was the only one. We must get rid of this, too." He pointed to the vibration cage. "With so many worlds, so many dangers like the fog entity in my own, the gate should be kept locked. This is a good world of yours, Falcon.

We must keep it isolated."

I heard Jan cry out. Even in that flashing second I wondered why she warned me if she hated me so. I spun about, saw Marlin standing in the doorway, flanked by guards, electro-guns blazing.

My shoulder flamed with blazing agony. Ruug said something incoherent, his ray-tube clattering on the floor. I flung my own tube up, squeezed it desperately.

The white beam sprang out, blinding, deadly. The three in the doorway stiffened. Bathed in the blazing glare, they crumpled nervelessly. Marlin's ruddy face stared up, an angry grin frozen on it.

Then, without warning, a sickly sweet perfume was strong in my nostrils. My brain shrieked warning. Involuntarily I held by breath, but I had already inhaled some of the anesthetic gas. The floor seemed to be drifting up toward me. I hit it, but there was no pain.

I was partially conscious, but unable to move. Presently I felt myself being tugged toward the vibrator cage. Desperately I struggled to move, felt life seeping back into my veins. I saw Ruug's clouded-glass face bending over me, felt something cold snap about my ankle. Prone on the floor of the cage I saw Jan lying limp and unconscious.

Ruug was fumbling with the lever in the corner. Instantly I realized his plan.

He would not share the rule of earth with me—no. I had served his purpose, like the vibrator cage. And, like the cage, I was to be destroyed—sent with Jan into endless vibration-worlds from which there would be no return.

Chained as I was, I could not reach the control lever, but I tensed, waiting for my chance. Ruug swung over the lever, turned hastily to hurry from the cage.

As he passed me I lunged at him, felt his bare legs sliding through my fingers. I wrenched desperately and he toppled back.

I grappled with him.

The meshes of the cage glowed. The warning blueness shimmered over them. Blackness took us . . .

THERE was that familiar, terrible feeling of unstable shaking; then around us rose the walls of Ruug's airship. This time the blueness did not fade; it glowed even brighter. Handicapped as I was by my chained leg, I was at a fearfull disadvantage. Ruug's inhuman body was strong, but one thing was in my favor; he knew nothing of modern wrestling—and the Falcon was a master of it.

It was like battling a giant reptile. I think the most horrible part of it was the utter lack of expression on Ruug's chitin-masked face. The blue fire flamed weirdly and there was no sound but the harsh rasping of my breath. The blackness of the metamorphosis closed around us.

I almost lost my grip in that second of trembling nothingness. Somehow I locked my legs about Ruug's as he was slipping away, gripped his throat with murderous fingers.

Through the blue glow, I caught a glimpse of this amazing new vibration-world into which we had been hurled. World of ice! Polar world of white desolation and death! Yet there was life here, for I saw blazing streaks of red light flashing outside in ordered formations.

I lost sight of them in a maelstrom of battle-mad conflict with Ruug. We clawed at each other, slugging and tearing, while the blueness flamed brighter. There came the shock of disorientation, the nerve-racking trembling—and still another world sprang into existence about us.

Cyclopean towers, jet black, reared toward a sky aflame with battle. Fantastically shaped airships raced and fought and fell in the great canyons between the colossal piles of masonry.

There was time for but a flashing glimpse; iron fingers were at my throat. I strove to break them, then remembered that Ruug had no bones. But I tore his hands away at last.

Blackness, shuddering void, and yet another world as we raced on through the vibrations. A dead world this time. Ebony glass stretched beneath a red moon. With a desperate twist I got my legs locked about Ruug's torso and strained desperately.

I fought to hold back his hands as they fumbled toward my eyes. His stomach-muscles were rigid as metal. Abruptly his hand swept to his belt, brought out something. He tried to throw it out of the cage. As I struck down his arm a key-shaped bit of metal clinked on the floor near Jan, out of my reach.

The void took us again; then another new world was about us. The ground, of a uniform pink color, heaved and billowed; it seemed to be alive. Without warning the rigid muscles of Ruug's torso caved in. His jaw fell, he shouted something unintelligible and went limp.

His eyes glazed. Colorless froth bubbled from his nostrils. Ruug was dead.

AGAIN the metamorphosis came—and this new world was the most dreadful of all. It was utterly dark, as though underground. A moist, hot wind, blew on my face, laden with acrid odors that made me shudder.

"Jan!" I called. "Wake up, Jan!"

She opened her eyes, staring at me. In swift obedience to my command she picked up the key, hurriedly she freed me. I got to my feet, staggered to the control lever. The premonitory shuddering was already racking me as I reversed it.

From the shaking nothingness we emerged into the world where the ground was pink and billowing with strange life. Then came the dead world of the hurtling red moon.

Jan was at my side. "We're going back," I said hoarsely.

The Cyclopean city sprang up outside the cage.

"You could rule Earth now, Falcon," Jan said.

The polar world sent its icy breath into the cage. Almost immediately the interior of Ruug's airship took its place.

"I don't want to rule Earth," I told her. "There are other things more important to me. Jan, the Falcon is dead. There's only Paul Dent now."

She did not answer, but her hand was warm in mine as the walls of Degg's laboratory swam into reality outside the cage.

●

ROBOT NEMESIS

An Interplanetary Novelet

By DR. EDWARD ELMER SMITH

Famous Author of the "Skylark" Novels

—in the Next Issue of THRILLING WONDER STORIES

A FASCINATING KNOWLEDGE TEST

ARE you a Genius? Here's a chance to find out. If you can decipher, unravel, solve and answer all the problems in this month's collection of scientific this-a and data, then you're a genius! If you find that you are not a Genius, don't be discouraged—remember "It's only a step from Genius to Insanity." Non-Einsteins should refer to Page 129 for the correct answers to these mind-twisters.

POSITIVE OR NEGATIVE?

The following statements are either true or false. Truth is stranger than fiction, so look before you leap. (Par for this course—15 correct.)

1. The perturbation of the planet Mercury can best be explained by attributing it to the attraction of an unknown planet between Mercury and the sun.
2. Fossils are helpful in determining the relative ages of the sedimentary rocks in which they occur.
3. The standard rate of descent of a man with a 24-foot parachute is about 17 feet per second.
4. The planet Pluto was named in honor of the man who forecast its discovery, *Percival Lowell.*
5. The response of a nerve fiber to a stimulation depends upon the intensity of the stimulation.
6. Dark nebulae have thus far been found only in the Milky Way region.
7. The principal function of the leaf is to carry on photosynthesis.
8. If an ionized gas is left to itself it will always remain in that state of ionization.
9. A method used for estimating the height of the Kennely-Heaviside layer is to measure the time interval between an emitted signal and its "echo."
10. Inertia is one of the few properties manifested by all kinds of matter.
11. A telescope which uses a lens for gathering light and forming a real image of a distant object is called a reflecting telescope.
12. The ultramicroscope is the best means we have of securing extraordinary magnifying power.
13. Dr. Urey recently announced the discovery of "heavy carbon."
14. Saturn's Rings are composed of numerous tiny moons.
15. Rabbits belong to the rodent family.
16. Cancer is the name of a constellation as well as of a disease.
17. Lagrange's solution of the three-body problem claimed that any object equidistant from both Jupiter and the sun would remain there and continue to go about the sun with the same period as Jupiter.
18. All the moons of the various planets have a period of revolution around the mother planet longer than the rotation period of the planet.
19. Shooting stars are really meteors.
20. Pluto is sometimes nearer the sun than Neptune.

TAKE A LETTER

Here are ten incomplete scientific facts. Three or more suggestions are offered in each case as possible fill-ins for each statement, but in each case only one is correct. Can you pick the winners? It as easy as A-B-C-D. (Par for this group—7 correct.)

1. If a pure tall male and a pure short female have 4 children the number of offspring that will be tall is: (a) 1, (b) 2, (c) 3, (d) 4.
2. Assuming that the Lorentz-Fitzgerald contraction is correct, for the Earth moving in its orbit the contraction on the diameter of the Earth is about: (a) 0.0025 inches, (b) 2.5 inches, (c) 250 feet, (d) 25,000 feet.
3. The ratio of the time taken to inhale to the time taken to exhale (including the quiet period before a new inhalation) is usually about: (a) 1 to 1, (b) 1 to 2, (c) 1 to 3, (d) 1 to 4.

4. The highest type of the extinct races of men is: (a) Cro-Magnon, (b) Neanderthal, (c) Piltdown, (d) Peking.

5. The stomach is shaped like a: (a) baseball, (b) triangle, (c) pear, (d) cone.

6. A gland that serves both as a duct and ductless gland (of external and internal secretion) is the: (a) liver, (b) pancreas, (c) thyroid, (d) pituitary.

7. The hardest substance in the human body is: (a) ligament, (b) bone, (c) dentine, (d) enamel.

8. If you are seated in a car while someone else is driving, the force which makes your foot use the floorboard as a brake is called: (a) conditioned reflex, (b) extraversion, (c) Galvanic skin reflex, (d) eidetic imagery.

9. The first part of a plant that emerges from the germinating seed is the: (a) leaf, (b) root, (c) stem, (d) flower.

10. Teeth are developed from the same kind of tissue that produces: (a) glands and skin, (b) red blood corpuscles, (c) muscles, (d) bones.

KEEP IN CIRCULATION

How's your circulation? The following words, when the letters are arranged in their proper sequence, all pertain to parts of the circulatory system in the human body. We'll be heart-broken if you can't unravel the first in this series. (Par for this stretch—9 correct.)

1. rathe	2. ratao	3. pylhm
4. teayrr	5. ricelau	6. rugjaul
7. lentcrive	8. ranmolyup	9. cupslecor
10. telcuyeoc	11. bileghnoom	12. dreampriicu

PAIR PLAY

The perimeter is to a rectangle as the circumference is to a circle. Carbon dioxide is to a plant as oxygen is to an animal. Get the idea? Now collect your wits and go to town on the following problems, pairing them correctly. (Par—3 correct.)

1. ———— are to amoebas what *legs* are to men.

2. *Lungs* are to animals what ———— are to fish.

3. The *Leonid* Meteor Shower is to November what the ———— Meteor Shower is to August.

4. The ———— is to the atom what the *sun* is to the solar system.

5. *Perihelion* of the earth to the sun is as ———— of the moon to the earth.

IDENTIFY-OLOGY

Of course you know what psychology, biology, geology and others are. But how many of the following "ologies" can you identify and explain? (Par—7 correct.)

1. anthropology; 2. ecology; 3. histology; 4. hyetology; 5. ichthyology; 6. meteorology; 7. morphology; 8. palaeontology; 9. phonology; 10. phycology.

WHAT'S YOUR SCIENCE I. Q.?

After you've completed the SCIENCE QUIZ, and checked your results with the correct answers, get a slide-rule and calculate your score. Here's how you rate:

49-57—A Mental Giant.
41-48—A Human Encyclopedia.
35-40—B.B. (Bachelor of Bookworms).
30-40—Try Crossword Puzzles.
15-29—Stick to Fiction.
0-28—Absolute Zero.

ANOTHER SCIENCE QUIZ NEXT ISSUE

MEN MUST DIE

A Novelet of the Spaceways

By

WARD HAWKINS

Author of "A Million in Green," etc.

"This monstrosity"—he indicated the Jovian—

CHAPTER I

The Seabrook Unit

IT STARTED in the spring of 2038. I had a job hacking an air-cab in the Sixth Quadrant of Greater New York, and that's how I came to know Martin Seabrook. He always called me when he needed transportation.

For some reason he took a shine to me. There's no explaining why, unless it was because I was big. But one day he offered me a job piloting his private craft and I took it. A year or so later he made me a sort of a bodyguard.

He was a little bit of a man, Seabrook was. He always looked shabby. His clothes were never pressed, nor his white hair combed. But his eyes were bright and brown and they had a way of looking deep inside of you. No one doubted that he had the best scientific mind of the age.

One day he called me into his office, and I found him sitting at his desk staring out across East River. He looked a century old. His face was thin and tired and his eyes were bloodshot from the hurt he had inside him. You see, he had cancer—the doctors had given him only a month or so to live.

"Mike," he said softly. "I want to ask a favor of you."

He waited a moment, looking at me. But I couldn't answer. Things were too balled up in my throat. Seeing him there taking the pain that ate his guts, because dope to ease it, would dull his brain did something to me. I just couldn't see him like that and not want to cry.

He must have known how I felt, for he went on without my answer. "You're

Seabrook's Body Was Dead—But His

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He must have known how I felt, for he went on without my answer. "You're not educated, Mike. To most people that means everything. But to me there's more—you're a man who can be trusted. You see, I'm undergoing an experiment tonight that may well mean the end for me. And, well—I want to know that you'll look after Mary—"

That finished me. He was asking me, a lout of a kid he'd practically picked out of the gutter, to watch after his daughter Mary—the girl who was to me a sort of a dream.

Sweet, she was, with chestnut hair and deep brown eyes that were good and kind and understanding. The one girl in her circle who accepted me as an equal. But that was her way, and I loved her for it—the way a man would love an angel.

If it had been hard to answer him before, it was impossible then. But he didn't need it. He stood up and held out his hand. "I know you'll look after her, Mike," he said huskily. "This is, perhaps, goodby. The best of luck to you, son—"

I held his hand for a moment, then turned and ran from the room. It is hard to put into words the things I felt—I was so young and things hurt

"is a typical specimen of the enemy"

Seabrook's Body Was Dead—But His Brain Wove the Fate of Two Planets!

"is a typical specimen of the enemy"

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I held his hand for a moment, then turned and ran from the room. It is hard to put into words the things I felt—I was so young and things hurt

so much. All that night I spent walking and thinking. Morning found me waiting in the office.

There was the closed door to the laboratory; the huge window beneath which the city was just stirring. I tramped back and forth between the two, desperate to know whether the old man lived or had died. I hadn't the faintest idea what the experiment was about, but I could imagine plenty.

FINALLY, Seabrook's young assistant, Allen Gilbert, poked his head through the door. His young, good-looking face was twisted and strained.

"It'll be an hour or two yet, Mike," he said.

Seeing Gilbert's face didn't help my nerves any, nor did it help to pass the time. Usually, he was quiet and capable, so I knew if the thing could upset him like that, it had to be pretty bad. That "hour or two" stretched to four before Gilbert showed again. He nodded to me, whispered,

"All right. You may see him for a moment."

The first thing I saw in the laboratory was the operating table. On it was the sheet-covered figure of Seabrook. And there was no mistaking the stillness of that figure—it would never move again.

I must have stopped abruptly, for Gilbert bumped me. I must have sobbed a curse, for Gilbert caught my arm. But I don't remember any of it — I was thinking that Seabrook was dead.

"Get hold of yourself," Gilbert hissed. "Here, drink this. You've got a shock coming."

With the drink to warm my stomach, I found that I could follow Gilbert toward a screened corner. Gilbert moved the screen and revealed a huge mound of apparatus covered with a black cloth.

Something under the cloth hissed and sighed as though breathing, and there was the steady sound that might have been the beating of a heart. Gilbert lifted one corner of the cloth, steadied me with his hand, whispered.

"Quiet, now. He's sleeping."

The apparatus was of glass and filled with a pale yellow liquid that circulated from a maze of tubing into a central chamber. My stunned senses reeled.

In that central chamber was a human brain!

Gilbert dropped the cloth and led me away. In the office he said, "That was the brain of Dr. Seabrook. His body was doomed by cancer, and transplanting his brain was all that could save his life. He trained me for this during the past five years."

"But—but," I asked dazedly, "how can he live? He can't be alive! He must be dead—you're just not telling me."

"No, he lives. That pump will keep him alive indefinitely. You see, over a century ago the beginning of this instrument was invented by two men, Dr. Alexis Carrel of Rockefeller Institute and Colonel Charles A. Lindbergh."

"In principle, the perfusion pump—that is, a pump which is able to keep the brain suffused or permeated with a nourishing liquid—is Dr. Seabrook's body. Instead of blood, we use a fluid which fulfills the same purpose—that of bringing food and removing secretions. The fluid is created, not by oxygen as in our bodies, but by a serum containing hemocyanin. We hope it will be even more efficient than blood."

"But what good is he? He might as well be dead."

GILBERT shook his head patiently. "He can think, now, without pain. Furthermore, he will speak, see and hear. Doctor Seabrook always contended that the nerve impulse that actuates the muscular movement is a form of electrical energy. By elaboration of this theory, he devised a means of connecting his brain to a photo-electric cell that functions as his eyes; and to microphones that enable him to speak and hear. Now, you'd better get some rest. He will sleep for at least twenty-four hours."

I left, too stunned to think. I didn't realize, then, that I had been privileged to see the first successfully transplanted brain.

The following day, Allen Gilbert and I broke the news to Mary Seabrook. Her courage in the face of it was fine and beautiful. Think of the shock it must have been to her, to suddenly find that her flesh and blood father was now only a brain in a network of tubing.

The three of us went into the laboratory. Gilbert and I on each side of her, ready to help her if the need arose. Gilbert moved the screen.

A quick gasp leaped to Mary's lips; her small body stiffened, but that was all. There was no hysteria, no tears. She just stood there trembling and almost afraid to look at the brain.

I saw that two microphones and a photo-electric cell had been added to the pump.

"Mary—" one of the microphones said softly, and the voice was strangely like that of Martin Seabrook. "Mary, girl, it's all right—"

It was a long moment before Mary spoke, and then only with a great effort. "Father—your pain, do you still feel it?"

"No, child. Nothing but a sense of well-being. I had forgotten what it was to be without pain. The lack of it amounts to almost pleasure. So you must be glad for me, not sorry."

"I *am* glad," Mary said. "Do you think clearly? Can you continue your work?"

Seabrook's answer seemed almost exultant. "Yes, fortunately, things have worked out beyond my fondest dreams. My brain is infinitely more efficient than before. There are several reasons for that. First, the pain I suffered made it extremely difficult to think; and without it, I am exhilarated tremendously. Then the fluid that is my substitute for blood, seems to be a hundred percent more efficient in removing waste and bringing nourishment. It has the effect of a powerful mental stimulant. Problems once beyond my power seem childishly simple now."

His voice died away and the room was silent for a long moment. Each of us was held in silent awe at the things we were seeing and hearing. Then, briskly, he spoke again.

"With this discovery comes the problem of using the new power to the greatest advantage. I have decided, finally, on space-travel. That science has been at a standstill since the Romaine expedition to the moon.

"IT TOOK those men five years to complete the round-trip and they returned hopelessly insane. Space-fever had caused their insanity—they had been cooped up too long alone.

"Their slowness was caused, not by the lack of power, but by the lack of a metal capable of withstanding the terrific heat of the rocket exhausts. It was go slowly, or not at all. But I think I have found the metal that will do the work.

"Tungsten, as you know, is the most heat-resistant, having a melting point of 3,370°C. But this is not enough for our purpose. Tungsten is prepared from the trioxide by reduction with carbon or hydrogen, or from choride. In the past year I have been experimenting in a process involving the principle of electrolysis to increase the metal's heat-resisting qualities, without success. Today, in the hour before you came, the correct method became clear to me.

"Here is the task ahead of us. We will build a space craft using this new alloy, and we will travel to one of the more distant planets to prove beyond doubt that space-travel can be an everyday reality. . . ."

Again his voice died out, but not to silence. Gilbert was muttering, "Splendid! Splendid!" and his face was lighted with a glow of fierce exultation. Mary, too, was trembling with excitement. I—I must confess it—felt misgivings.

However, I held my stupid tongue, possibly through fright, and Seabrook went on.

"We four must work together. Without complete cooperation the thing is not possible. Allen will be my closest assistant. He is fully capable of working out the problems of design under my direction.

"You, Mike, will be in charge of the construction. You are capable of handling men—no, don't interrupt. Possibly, you have some doubts of your ability, but I have none. The thing is settled, you will work under the direction of both Allen and myself.

"Mary, your task is to keep these two men fed properly and to see to their rest. They are fools enough to neglect themselves in the heat of the work—I know that, for I would do the same. Now, here are your orders—"

He went on, then, to outline a pro-

gram of work that was tremendous in its scope. He talked for hours on details of plans, construction methods and materials. I was amazed that one brain could conceive so much in so short a time.

When we left that room, I, at least, was staggering under the terrific load of facts and details with which he had weighted us. And I was frightened, afraid that I would not come up to the standard Seabrook had set for me in his plans.

Remember, I had little education, I was young to the point of adolescence. But I did have a good working knowledge of mechanics picked up while hacking the air-cab. And I was big enough to back any bluff I cared to make.

WITH these two things I set out to supervise the construction of the space ship. These two and one far greater—the confidence Seabrook had in me. I take no credit for the success I had. Seabrook had inspired me to a point infinitely beyond my own ability. And, too, he was constantly foreseeing my problems and directing me to the right path.

The ship was completed on the twenty-first day of September in the year 2038, provisioned and ready for flight. There had been no publicity. Seabrook had wanted none.

Gilbert had constructed a portable unit for Seabrook, and I had built a special compartment for it on the ship. The rest of us, Gilbert, Mary and I, walked aboard with only the clothes on our backs. The air-lock was sealed, a few farewells, and all was ready for the experiment.

What few misgivings I felt as I slid under the controls were lost in a choking sense of pride—pride that I, Mike Harrigan, had been allowed the privilege of piloting this ship. Whether it was to be to my death or to my everlasting fame was somehow unimportant.

I lifted the ship slowly, thrilling to the perfect ease with which the controls responded, sent it at a gradually increasing speed outward toward the void—toward the infinitely distant planet of Jupiter. . . .

CHAPTER II

The Lubians

YES, Jupiter. Nothing less would satisfy Seabrook. He had insisted on it as the test to which he would put the ship. But more precisely, our destination was the Red Spot of Jupiter.

This spot had first been discovered in the year 1878. There seemed to be no explanation for it, and the mystery of its presence had intrigued Seabrook for years. Long ago he had determined that he would be the first to discover its cause.

About the journey—I hesitate to give you our impressions. But visualize, if you can, an attempt to penetrate the complete unknown.

The dangers were real. Few of the asteroids had been charted, many of our calculations were problematical. No one had ever gone this way before.

The first days were filled with excitement. But as the days faded into weeks and the weeks into months our senses became dulled to the danger. We were awed by the tremendous distances around us, by the utter aloneness of space.

Earth had dwindled rapidly to a fading green star very little different from the millions of other stars behind it. Jupiter had grown to an amazing brilliance there before us.

All my waking hours were spent at the controls. Mary and Gilbert stood watch while I slept. Seabrook devoted his time to the solution of problems of sustaining our lives on the planet ahead.

Too much credit cannot be given him for the development of the space suits he built during our Journey, or rather which Gilbert built under his direction. The suits were equipped with antigravitational units capable of neutralizing a force many times greater than we expected to find on Jupiter. Also, they provided a constant temperature and atmospheric pressure.

But perhaps the greatest accomplishment was the development of the "Thought-Interceptor." Seabrook had elaborated on the known theory that thought-waves are electrical. He had

developed a device that would intercept these impulses, translate them into vibrations similar to sound, and with bone-conduction, pass them through our auditory system to the brain. With this, we would at least know what the inhabitants of Jupiter were thinking.

As we drew near the planet, it became apparent that the red spot was some sort of gas. The atmosphere extended something like ten thousand miles from the surface of the planet. The gas reached this limit and extended horizontally beyond the limits of our vision.

Here, then, was the answer to our astronomer's question. Just why the gas was confined to this area alone was beyond our knowledge at the time. Samples were taken during our slow descent, and Gilbert discovered the gas to approximate N_2O_4, or Nitrogen Tetroxide.

Our first impression of the surface of the planet was the incredible height of the vegetation. Towering what seemed to be thousands of feet above the surface, were great trees of some unknown species. Beneath the trees, the ground was obscured by a smaller, more dense foliage.

WE CRUISED along above the tips of the trees on an eastward course for several hours, looking for some sign of moving life, either human or animal. Finally, we broke over a tremendous mountain range and dipped into a valley. Here we discovered an open plain of perhaps a thousand square miles. And on this plain was a great city—but a city of incredibly small buildings!

It was not beautiful — the houses were too small, too squat and square. From some of the larger buildings great quantities of the gas poured upward. That seemed to indicate that through some strange working of nature, the gas was the atmosphere these people breathed!

Near the center of the metropolis was an airport. There were ships there that rose in a cloud to meet us. It was impossible to know what sort of creatures guided them, we were much too high to discern anything that approximated human form.

The ships, less than a fifth the size of ours, seemed friendly enough, though they fairly bristled with weapons—even as we neared the landing field there was no sign of violence.

Just before landing, Mary, who had been at a starboard port, called our attention to something on the eastern horizon. At first, we saw an odd blue light flashing intermittently, later we made out great domes that might have been part of some gigantic city. But there was not time then to investigate.

I was the one who made the discovery that the city below was unmistakably in a state of war. The city was walled, and along the ramparts of this wall were cannon-like weapons out of which spurts of blue flame flashed from time to time. There was no sign of the enemy other than the domes we had seen in the distance.

Before grounding the ship, Seabrook ordered us all into the space-suits—his own unit being similarly equipped. I, for one, never let my hand stray from the Niter-gun at my belt.

Amazingly, the airport became crowded with strange people in a matter of seconds. Strange, because we had expected a people built more in the proportions of their planet—giants—but not one of these we saw was over three feet tall!

Their heads, in proportion to the rest of their bodies, were tremendous however, encompassing half their weight. Of the features, the most prominent was the great, obsidian disks that were their eyes. Lidless, expressionless and staring, one became conscious of a sense of evilness, of something ominous and forbidding behind their inscrutable depths. From between their eyes projected a sharp beak of a nose, and the mouth was small and round and lipless.

Their bodies were considerably broader than they were tall, supported by spindly legs and supporting equally spindly arms. Their clothing was of some shiny black material, metallic in its smoothness. About their waists was a belt from which was suspended a glittering array of strange weapons.

We were looking at them, when suddenly the ship rocked beneath our feet.

THE motion was gentle at first, tentative. Then the ship tilted sideward as though subjected to a tremendous force against the hull near the entrance port.

"Mike!" Mary cried suddenly. "They're breaking in!"

That entrance port, built of the finest, toughest metal Seabrook's intelligence could devise, was bulging inward, cracking!

A sudden cold hand of fear twisted deep around my heart. In a sort of wild desperation I drew my Niter-gun and prepared to blast whatever showed in that port into eternity. Seabrook's quiet voice stopped me.

"No, Mike. Hold your fire. I think it would only make matters worse—"

A moment later the port crashed to the deck. Instead of the tremendous machine I thought would be necessary to break that port, there were only two of these strange people staring at us. They had broken the port with their own strength!

Such strength in bodies of that size was incredible. But I had forgotten that they lived on Jupiter—a planet with a force of gravity many times that of our own. To exist, they had to be of greater mass and of immensely greater strength.

In spite of my fuddled wits, I managed to put myself between the port and Mary. Gilbert stood watching the creatures, apparently lost in their scientific aspects. Suddenly he turned and ducked into the control room. I understood why, for one of the creatures had caught the edge of the port and was climbing in. The ship rocked violently beneath his weight—a weight that must have been tons!

The heavy steel of the deck bent as he threw a knee over the edge and pulled himself up. But at that moment, Gilbert threw in the ships anti-gravitational field, preventing the stranger from breaking through the deck. This field, the same as the one incorporated in our space suits, was another of Seabrook's developments.

Seabrook had discovered the force of gravitation to be a form of electro-magnetism. By identifying the force in its true electrical nature, it had been comparatively simple for him to create a field of force about the ship that repelled with the same force by which the ship was attracted—as like poles of a magnet—in that way nullifying the force of gravitation.

Feeling the loss of weight, the creature looked around owlishly, his mouth splitting in what must have been a grin. Suddenly, our Thought-Interceptors began working.

"I am Ikor," the thought-stream said, "Ra of the First Company of the Lubian Expeditionary Forces. You are my prisoners!"

Prisoners! Expeditionary forces! Then I had been right. This city was in a state of war. But there was not time for further thought. Ikor was walking ponderously toward Seabrook's unit.

I had seen the port broken by the strength of these people and I understood what would happen if he so much as touched the Unit. He raised his hand—and then I shot him.

THE effect was amazing. Suddenly his face disappeared behind a mask of flame. The Niter guns were automatic pistols of a very small caliber that fired a shell loaded with an explosive similar to nitroglycerin. The effect on a human head would have been to destroy it utterly. But upon him it had little effect at all.

He rocked backward a bit from the force of the blast. Queer sounds came from his open mouth. I moved quickly so there would be no danger of Seabrook's unit being damaged by the explosion and fired again. Still he did not fall.

But I kept firing. As he stepped back, I followed him with the gun, keeping a constant play of explosives against his face. The cabin roared with the sound of the explosions, solid blasts of air knocked me back. Nothing could stand up under that continued force. Not even he. His head split, suddenly, flew into a hundred pieces, and he fell heavily to the deck.

Pieces of his head riccocheted around the cabin causing unbelieveable damage — they might have been great chunks of steel. One of them caught me on the leg and knocked me sprawling. Before I could regain my feet,

another of the creatures had gained entrance, and his thought-stream roared in my ears.

"Hold your fire—no harm will come to you!"

Then, more quietly: "Ikor deserved destruction—he was too stupid to exist. A *grovonan* would know that our touch would destroy the materials of you people of lesser mass."

Seabrook's thought-stream answered: "We want peace. The killing of one of you was unfortunate, but since you know why, there should be no cause for further trouble."

The creature bobbed his ugly head in agreement.

"Excellent. My name is Loogo, and I have been instructed to escort you to the commandants. Will you come?"

At Seabrook's order, I adjusted the anti-gravitational field of his unit to zero and guided it to my shoulders. We followed Loogo from the ship. The crowd split in an aisle to let us through to a carrier that was similar to a truck of our time. The driver sent it rocketing through streets lined with these queer houses, few of which reached above my head.

After perhaps ten minutes of driving we drew to a stop in front of a building that was easily five times larger than any of the others. We were ushered into a room of considerable size, apparently an audience chamber.

At one end was a raised dais on which three men were sitting. Their clothing was a yellow material, contrasting to the black the bulk of the Lubians wore and indicating a very high rank.

Somehow, the thought-stream that came through my microphone from one of the men on the dais was pompous and at the same time sly.

"You are welcome," the thought-stream said, "to the headquarters of the Lubian Expeditionary Forces. We, the High Command, extend to you our meager hospitality and hope that we are able to make your stay pleasant."

"DRIVEL!" I thought unconsciously, forgetting that it was as clear to them as the spoken word. "You sound like a lying politician. You're after something, or I'm a monkey's uncle. . . ."

"Mike!" Seabrook's thoughts whispered at me. "Be careful!"

The sudden concentration of the commandant's eyes on me, made me realize what I'd done—I had a lot to learn in the art of telepathic conversation.

"You doubt us," the Lubian almost purred. "Please understand that we mean you no harm. Our interest in you is purely scientific. Will you step forward and place that queer object—ah, yes, you call it Seabrook—on the floor so that we may inspect it?"

Seabrook told me to do as they said. I did, though as I stepped back I held my hand close to the Niter-gun. The three Lubian Commanders waddled down from the dais and crowded around the unit.

My thought-interceptor was silent during their close scrutiny of the unit. Seabrook began a voluntary explanation of himself, told them his body had been a victim of cancer and how the transfer had been made.

"Very clever," the Lubian said. "You must be very efficient — you have accomplished so much in space-travel."

"Quite efficient," Seabrook agreed calmly. "So efficient, in fact, that I understand *all* your thoughts. Even those you suppose are hidden from us—"

The three commandants fell back chattering in amazement at Seabrook's announcement. Loogo and several of his men moved close behind me, before the Lubian leader spoke again.

"There is no need, then, for further pretense," he snapped angrily. "You are prisoners of war. If you conduct yourselves properly we will assure you a quick end, but, unfortunately, we cannot free you. You are a strange people and it is necessary that we discover the workings of your bodies on our dissecting tables—"

Dissection! For a moment I was too stunned to think. Then, as the full impact seeped through my brain, I went suddenly berserk. I clawed frantically for my gun, grasped it, drew it—but Loogo had intercepted my thoughts.

His hand descended on mine, knocked the gun spinning from my hand. The blow could not have been more than a tap in proportion to his strength, but I felt a numbing shock. Instantly my right arm hung useless—I could not

lift it, nor move my fingers. The arm was broken, I knew it. And with that knowledge, what little remaining sanity I had vanished in a red wave of fury. I turned to Loogo, drove my left hand with all my weight into those staring eyes.

VAGUELY, I heard Mary's scream above my thundering anger, and Seabrook's frantic order for me to stop. But they were lost in the shock of the blow, in the numbing flame of pain that shot up my arm. Loogo had made no effort to avoid the blow. Instead, he had leaned into it. When my fist struck his face it felt as if I had struck a block of iron.

He did not move afterward, though the blow would have knocked a human the full length of the room. He stared at me, amused by my astonishment and pain, then pushed me gently.

I say gently, but it drove me crashing into the wall. My head struck the back of my space-helmet with a stunning force—and that was all I remembered. . . .

CHAPTER III

The Noble Jovian

WHEN I returned to consciousness, it was to find Mary watching me with a deep concern in her eyes.

"Steady, Mike," I heard Gilbert say. "You're all right now. . . ."

A sudden memory of all that had happened hit me. I pushed myself to a sitting position. Gilbert forced me back, but I had seen enough. We were in a cell of some sort, a small, barren room without windows or doors. Then I became conscious of the ache in my right arm, the bulky bandage that was around it, and I was glad to lie still.

Gilbert said: "You've been out a long time. After Loogo knocked you kicking, Mary and I took you back to the ship and set your arm. You've got a couple of ribs cracked beside two knuckles on your left hand—"

"Where's Seabrook?" I asked.

"They took him somewhere," said Mary, who answered, and in spite of her courage there was a tremor of panic in her voice. "They promised not to hurt him—but what are we going to do?"

They both looked at me. Gilbert was a scientist; fighting was not in his line. Mary was a woman. So the two of them looked to me for the answer to her question—and I had just shown how much good I was against these people.

For the lack of something better, I said, "What's the dope on this war? Who are they fighting and why?"

"These Lubians are from the first satellite of Jupiter—the biggest." Gilbert said. "The true Jovians live in that domed city we saw just before we landed. The Lubians decided to conquer this planet. They started out in our nineteenth century, trans-shipped all their people here and started fighting. They haven't been able to do much, though the Jovians don't seem to fight back. . . ."

He let his voice fade out, because a section of the wall slid back and one of the Lubians, a guard it seemed, motioned us to follow him.

He led us to a room that was even larger than the audience chamber we had first seen. It had to be, to house the tremendous creature that was lying on the floor. A true Jovian!

He was at least a hundred feet long, or tall, if he had been standing, and built more in the same proportions as ourselves. The most striking feature about him was his great, luminious eyes—kindly eyes. You had but to see them to know that. The rest of his features were ascetic: a high, clear forehead, a thin nose and a sensitive mouth.

Some sort of breathing tube had been cut into his throat, and led to a filter arrangement that stood close by. That seemed to indicate that the nitrogen tetroxide which the Lubians breathed was not the Jovians normal atmosphere.

Two of the Lubians had mounted the Jovian giant and were walking on his chest. They were like gnats on a mastodon.

The yellow-uniformed commandant, who was standing on a platform near which I could see Seabrook's unit, broke the silence.

"WE brought you here to secure the cooperation of the one you call Gilbert," his thought stream said. "Seabrook has agreed to build the weapon that will win our conquest. He needs Gilbert to accomplish the actual construction.

"This monstrosity"—he indicated the Jovian—"is a typical specimen of the enemy—an inferior race with no ability other than stubborness. Luckily for them, they foresaw our invasion and constructed their cities into impregnable forts.

"If you will assist us, we will let you live until the weapon is completed—though we must hold you for our laboratories afterward. But if you will not, the female will be subjected to. . . ."

Seabrook's calm thought-stream broke in. "Give your consent, Allen. They intend to torture Mary, if you don't."

It was a long time before Gilbert answered. There was a deep courage in the man as well as a splendid mind. Had they threatened him he would have told them to rot in hell first. But torture of Mary was a different matter.

"Just as you say," he answered quietly.

"Excellent!" the commandant said. "We will leave you this specimen for experimental purposes. You will find their reaction to pain most amusing. Loogo will instruct you in the use of the appliances—"

Without waiting for our agreement, Loogo moved to a queer set of headphones near the Jovian's head. He applied them to the helpless creature's ears, then stepped back and threw a switch. A high-pitched drone filled the room. The Jovian's eyes closed and his facial muscles writhed in unholy pain. The sound was exquisite torture to him!

It might be compared to the torture a person would suffer who is particularly sensitive to a high frequency tone—such as a fingernail scratching on glass—if he were subjected to the tone amplified a thousand times. A terrestrial, under the same conditions, would lose his sanity almost at once.

The commandant was watching the twisting face of the Jovian with evident pleasure. His thoughts were speculative. "It's too bad we could not contrive a weapon to use that tone—the effect is so pleasing. However, you have a month in which to accomplish your task—a month of your time. Let me suggest that you succeed, for if you don't, you will have the privilege of watching the female dissected—"

The devils! They knew—probably from my mind—how much she meant to us, and the limits we would go to protect her. They seemed to take an unholy delight in our mental torture.

They left us, all of them, trooping out in single file. Gilbert leaped to the switch and cut the power. The scratching sound died away; and there was an infinite gratitude in the Jovian's eyes when they slowly opened.

His thoughts came to us dimly—dimness caused by pain.

"I am grateful, Earthmen—sometimes I think that tone will become more than I can stand. These Lubians are ingenious in their way."

I GAPED at him open mouthed—there had not been a single note of bitterness in the Jovian's tired thoughts! How long he had been a prisoner was hard to guess. How long he had suffered torture was beyond imagination. And still he had not the slightest desire for vengeance!

"It must seem strange to you," he said in answer to my unspoken question, "—our lack of animosity toward these invaders. But the reason is simple. We are the oldest race of the Solar System—older than your race by millions of years. Long ago we realized the futility and the ultimate disaster of fighting. All thought of it has been bred out of our minds.

"We have accomplished much in the plane of pure thought. Telepathically, we can project ourselves anywhere in the universe, and in that manner have watched your civilization grow with a great deal of interest. We have solved the problems of life, the beginning and the end. The future and the past are as plain to us as the present.

"So far have we advanced from the primitive, that the particular phase of our minds that was once devoted to combative reasoning has long been atrophied. We are helpless to do more

than protect ourselves. We cannot think of a single weapon to destroy life—even though our own lives are the price of our inability. A pitiful, an unbelievable condition, I grant you. We could but wait your coming in hope that you would save us. . . ."

His thoughts faded out in pure exhaustion. He might have fallen asleep. An utter silence gripped us—the three terrestrials whom he had asked to help him.

There was absurdity in the Jovian's predicament. But you can't laugh at a thing so infinitely beautiful and fine that it hurts your throat to think about it. If all the peoples of all the worlds were like this Jovian, this universe would be a paradise. They represented all the good of which a race could ever be capable—the ultimate toward which any race could strive.

"I think we can help," Seabrook said softly. "I pray to God that we can. But now Allen, Mary and Mike, we have much to do. First, remember this. Choose a scene to visualize, so that you may conceal your thoughts from the Lubians. You will find, that with practice, you will be able to think behind the scene you transmit.

"Allen, come, we have so little time. Mary, you and Mike must remain here. They insisted on it as a guarantee against our escape. You will be permitted to come to the space ship one at a time every day or so to replenish your space suits. For the moment, then, goodby—have faith in me. . . ."

GILBERT shouldered the unit after clasping my hand and Mary's and they left us. Mary stood looking after them for a long moment, her thought-stream suddenly a confusion of emotion. What I was thinking must have reached her, for she turned to me, her eyes bright with moisture and her mouth trying to smile.

"Good, Mike," she said. "I'm proud that you think that of me—I'll do my best to deserve it." And suddenly she was crying against my shoulder.

I held her clumsily, feeling all the exquisite embarrassment caused by knowing she had intercepted my thoughts. I would no more have told her that I loved her than I would have spat upon an altar. But unconsciously I had thought it and she had understood. . . .

CHAPTER IV

Behind the Ol' Swimming Hole

THOSE first three weeks, for Mary and me, were spent almost alone. Time hung with the weight of centuries upon our hands. It was my self-appointed task to keep her thoughts occupied, for around us was always that certain knowledge that very soon we would die.

We found some amusement in following Seabrook's orders about the mental picture to occupy our minds. For mine I had chosen a swimming hole I had known as a boy. In time, it became so real that I could see every detail. The trees, the mud, the water, the sun on my bare hide, the chaw-beef and the lickings—they were all there.

Mary told me her thought was of shopping in New York. She said she would go into store after store buying endless new gowns that she would not wear more than once before discarding. She said she spent thousands and filled wardrobe after wardrobe, a thing I think every woman would like to do.

We saw little of Seabrook and Gilbert, and then only on our occasional visits to the ship.

Gilbert had become horribly thin and worn in three weeks. Overwork must have caused the most of it—though something else bothered him too. Afterward, when I found out what it was, I was amazed that he could work at all.

The weapon they were building was beyond my layman mind. To me it was simply a mass of electrical machinery, tremendous in size. Seabrook told me that it was a disintegrating ray, capable of destroying the Jovian cities.

Knowing that we were to die inevitably, I could not understand Seabrook's willingness to destroy the Jovians simply to give us a few more hours of life.

"Why," I asked bitterly, "can't we turn the Niter-guns on ourselves and put an end to it now?"

Seabrook answered me tiredly and patiently. "That's like you, Mike. But be patient—and please have faith in me."

Yes, there were times when I doubted him. I was too stupid to notice that the ship had been repaired and was ready for flight at a moment's notice.

Mary and I were allowed a certain amount of freedom during those last few weeks. We spent them wandering about the city. Millions of Lubians were pouring in from outlying districts, bringing with them all manner of strange weapons.

They had come to be in on the great conquest!

Soon the death-ray Seabrook was building would disintegrate those huge domed cities of the Jovians, which had thus far withstood every form of weapon the Lubians had been able to devise. And the Jovians would fall under the ray, letting in the Nitrogen Tetroxide gas and the hordes of Lubians who would slaughter them like sheep.

And when they died, we, too, would follow!

THE morning before the time set for the completion of the weapon, Mary and I were summoned to the audience chamber. The three commandants were there, as well as Seabrook and Gilbert and a dozen or more of the Lubian lesser officers.

Gilbert's face was horrible to see. It had grown whiter and thinner with the weeks until now it was little more than a skull. Some desperate knowledge was eating at his brain. But in spite of the thin paleness there was a cold desperation in his eyes, a firm resolve.

Seabrook's thought-stream said, "The weapon is completed—or rather, it lacks but a few moment's work before it will function. The attack is scheduled in three hours."

The weapon completed! Then this was the end.

Mary said, "Father, you can't! You can't kill the Jovians—there's no reason to. We four will die anyway. The least we could do would be save the Jovians—"

"Ah, but your father is more clever than you think." It was the commandant, sly and purring. "He has forced us to agree to let Gilbert, Mike and yourself go free before he will complete the weapon. We have agreed, rather than waste time making him change his mind—"

"No!" Mary cried. "Father, you can't! Let them torture us—it is only we three against the whole Jovian civilization."

I felt a little sick. Here, then, was the reason Seabrook had agreed to destroy the Jovians—so that we three could live!

I said: "Nothing doing. We don't go—that ray will rot before it ever fires—"

"Please. Please," Seabrook cut in. "This is my wish—you three must go back to the earth. The profit of our coming here will be lost if you don't return—"

"Enough of this!" the commandant roared. "The thing is settled. You three have no choice—go to your ship at once!"

The Lubian officers closed in around Mary, Gilbert and myself in a tight circle. Gilbert stopped them suddenly. "Wait!" he cried. "These two may go, but not I. You'll never get that weapon to fire without me—I have attended to that!"

"What do you mean?"

"I fixed it so it wouldn't fire. Even Seabrook doesn't know what I have done."

The room was suddenly silent. The Lubians were trying to probe Gilbert's brain to intercept his thoughts. But every moment in which he was not speaking, his brain was filled with a monotonous confusion of scientific formulae, visualized by him to prevent them reading his mind and gleaning his secret.

Suddenly, the commandant exploded. "The female! Take her, show these Earthmen we will not stand for trifling!"

Gilbert choked. "I'll never tell you, if you touch her!"

Hell might have erupted in another moment, had not Seabrook cut in with his steady thought-stream.

"GIVE me a moment with Mike. I'll guarantee these three will leave and the weapon will fire. Three minutes is all I ask. Torture would take hours—"

The Lubians hesitated, looked to the commandant for orders. He was undecided for a long moment. Finally, he snapped, "Three minutes, then. No longer!"

The Lubians split into an aisle from me to Seabrook. I went to him wondering what he could want of me. He ordered me to lift him and carry him into a small ante-room. The panel slid shut behind us, and then we were alone.

Seabrook's thoughts came to me softly, for he was infinitely tired. "Mike, I have only a few things to say. You're the one who can save Gilbert and Mary. You must take them with you by force. Do you understand?"

"But the Jovians—you can't, you mustn't kill them. . . . "

"Mike, I've asked you to believe me. I'm doing what I think best. You promised me to take care of Mary—remember that day in my office? I said I could trust you, and I know I can. You cannot fail me now."

He was right, I had promised. And I remembered how much that promise had meant to me when I gave it. But I hadn't known, then, it would be so hard.

I lifted the unit and carried it back to the audience chamber.

"Well?" the commandant demanded impatiently. "What is your decision? Will Gilbert stay?"

"Let me talk to him," I said.

They shoved Gilbert toward me, and I moved close to him thinking hard about the swimming hole so he would not know my plan.

There was a question in his eyes, a sudden suspicion. But before he could draw away, I drove my left fist hard against his stomach. The space-suit absorbed most of the blow, but it was enough to bend him over.

Then I brought my fist down on the back of his neck, snapping his head against the back of his helmet. He dropped without a sound.

Mary's frightened scream pounded my brain. "Mike! Stop!"

She dropped beside Gilbert, her face white and twisting. When she looked at me there was a strange, vivid anger flaming in her eyes.

"You beast!" she choked. "Why? Why?"

Seabrook spoke to the commandant. "The machine will fire—Gilbert lied. Let them go."

I caught Mary's shoulder and lifted her up. "We're going to the ship, Mary. Come on."

Suddenly she was transformed into a fighting fury. She leaped up and pounded me with her small fists. "We're not! I won't go—I'd rather die a hundred times—!"

There was nothing to do but take her by force. And I did, holding her kicking and squirming under my arm, sick because I had to act against the will of this girl who was sacred to me.

IT did not occur to me that it was strange the Lubian who carried Gilbert and escorted us to our ship was not Loogo, who had been detailed to watch us during our stay. I should have noticed, for I had grown to hate that ugly face and staring eyes with a burning intensity. But my mind was filled with too many things just then.

I forced Mary down on one of the bunks in the control room and tied her there—never, for even a moment, had she stopped fighting. I put Gilbert's unconscious form on another. The Lubians had not entered the ship, but had remained outside, holding their guns on us so I could do nothing but take off.

I slammed the port in their faces, then went to the control room. There was a long moment that I sat at the controls, still undecided, still hating desperately to leave Seabrook.

He must have been following me in all my movements, for I heard his thought-stream urging me on.

"Take off quickly, Mike. You must hurry, or everything I have planned will come to nothing. Goodby, lad—and remember your promise—good luck to all of you. . . . "

There was a swimming haze in front of my eyes. A horrible lump blocked my throat, drew it taut and aching. I cut in the degravitator and started the

engines unconsciously. Then I jammed down on the engine feed, not caring if the rocket blast burned half of the Lubian population, and sent the ship roaring into the sky.

There was one thought I could not shake. Seabrook had sacrificed himself and the Jovians that we three might live!

The more I thought of it, the more difficult it became to hold the ship on its course. But I think I would have made it, had it not been for Mary's voice, low and shaky, cutting with the intensity of its passion.

"You coward!" she said. "You filthy, rotten coward. You're leaving them all to die, so you can live. Mike Harrigan, you're not fit to live—"

CHAPTER V

Thunder Over Jupiter

I COULDN'T go on after that—not after Mary, who meant so much, had called me that. I stopped the ship and let it hang weightless on the degravitators.

Suddenly, a course was clear to me—I could fulfill my promise to Seabrook and still save the Jovians. I would bomb the death ray!

I say, I thought this—and that all but finished me.

The ship rocked suddenly with the movement of a great weight. A new thought-stream paralyzed me.

"You will not bomb that weapon—turn around and you'll understand why!"

I spun to see the squat figure of Loogo standing in the doorway to the after cabins! Behind him was his lieutenant!

Both of them were holding deadly handguns trained on my head.

I gaped at them, voiceless and thoughtless in astonishment. Loogo spoke again.

"Continue the flight. We must remain aloft until Seabrook shows my countrymen how to fire the weapon. Obey me, or die. I am perfectly capable of operating this ship."

I turned numbly back to the controls, trying desperately to think, and started the ship upward again. Loogo seemed to enjoy the situation, he could not help bragging.

"You must think we are fools, if you believed we would let you go free. Your world is the next we will conquer. With this ship as a pattern and the death ray as a weapon we will be invincible. We will rule the universe."

What little intelligence I might have had, seeped back to me as his voice rattled on. I had sense enough to visualize the swimming hole to hide my thoughts as a plan took form in my mind. A wild, crazy plan that left us but one chance in ten of living—but it was worth a try.

First, you must understand that our field of gravitation was independent of that of Jupiter. The anti-gravitational field in the hull neutralized the planet's pull. The ship's own gravitational field, working through the deck plates, gave us our normal weight, to which we were accustomed, but it had to be quite the contrary in the case of the Lubians—they were *not* accustomed to it.

There was my answer—I cut both fields of gravitation!

It had the same effect as if I had *instantly* tipped the ship. The two Lubians spilled backward through the door into the stern of the ship!

The danger lay in the tremendous weight of the Lubians suddenly crashing the full length of the ship. Would they break through the hull? Would they damage the engines beyond repair, to leave us at the mercy of Jupiter's tremendous pull?

They struck the after bulkheads with a staggering force. The ship lurched to a stop, hung there, her beams fairly screaming with the terrific strain.

The engines stopped and suddenly we were pitching downward!

I jerked the Niter sub-rifle from its boot beside the controls, spun in my bucket seat, hanging in the safety straps. The Lubians were moving sluggishly—but they were moving, pointing their guns at me.

I PRESSED the trigger of the sub-rifle. It quivered, sending a stream of highly explosive shells into the Lubians. And none too soon.

A flash of blue light came from the center of their twisting arms and legs. Something exploded against the side of my space suit with tremendous force.

Blackness began closing around my eyes. But the sub-rifle kept spitting even after the strength had left my fingers, blasting those two Lubians into a hundred pieces.

After the gun fell from my hands, I forced myself to turn and cut in again the anti-gravitational field of the ship's hull.

That lever seemed to need the strength of three men to pull—I fought it through sweating eternities, while the ship plummeted toward the rapidly nearing surface.

Finally, it gave and we were free of that terrible sucking force that would have killed us in another moment.

But there was still the tremendous speed. It would carry us on with its own momentum, unless I could bring the ship to a plane horizontal to the planet's surface.

Somehow, I managed it—though I shall never know how. But I did, for when I regained consciousness some time later, it was to see Gilbert at the controls sending the ship upward again.

He saw that I had come too, said, "Good work, Mike," and his voice was utterly weary. "You got us out of a bad mess."

I realized, then, that I was lying on a bunk. He had taken my space suit off and had bandaged my side. That he had repaired the damage done to the stern was evident by the fact that I could hear the motors roaring.

"Yes," he said. "The damage wasn't too bad. I fixed it and dumped your two friends through the air-lock. Now you take it easy. I owe you and Doctor Seabrook an apology for not obeying orders—I deserved the slugging you gave me. Knowing from the beginning what Seabrook intended, drove me nearly insane. You see, I thought so very much of him—"

The thought of Seabrook brought me back to my senses. It meant the death-ray would soon be working—that the Jovians would soon be dying like flies!

"Stop!" I roared, pushing myself to my feet. "We've got to go back—we've got to bomb that death-ray!"

"No," Gilbert answered tightly.

Something inside of me snapped. "Damn you!" I cursed him. "Get away from those controls. If you haven't the guts to do it, I have—"

But he paid no attention to me as I crawled toward him. He was intent on the instrument board, watching the moving dials.

In a few moments I would reach him. I would drag him from those controls, if I had to kill him to do it. I hitched myself across the deck, literally roaring curses at his hunched shoulders.

JUST before my hands touched him, he moved the controls and brought the ship to a course that was parallel to the planet's surface. He spun to me, standing up, and his face was a stiff, white mask.

"We're clear of the atmosphere," he said hoarsely. "Now come to the screen and watch."

Something in his voice made me obey him—something in the utterly tragic cast of his face. The visa-screen came to life as he brought out the image of the death-ray in the city so far below us.

The hordes of Lubians were gathered around it in teeming activity. Obviously, they were about to fire. Near the gun, I could see Seabrook's unit.

And then the Lubians fell back, leaving a cleared space around the weapon. Only the yellow-uniformed commandant stood near it; his face smug in the strange, red light of the nitrogen tetroxide atmosphere.

"Gilbert," I pleaded. "We've got to smash that thing. We can't let them kill the Jovians—we can't—"

The abrupt pressure of his fingers on my arm stopped me. "Wait," he said fiercely. "Watch!"

The commandant of the Lubians waddled over to the great switch, paused there for a moment, evidently enjoying these last few moments before they would launch the attack that would mean victory.

Then his hand dropped—dragged down the switch!

The huge weapon came suddenly to

life. As it gathered power, a confusion of strange lights flashed back and forth through its intricate workings, growing brighter every second.

A blinding flash leaped along the barrel. Suddenly, our screen was nothing but a cloud-obscured chaos!

"God!" I stammered. "It—it blew up!"

Gilbert did not answer until he had snapped the switch that cut out the screen and turned away. His face, then, was strangely quiet—as though a great burden had been lifted from his shoulders.

He walked to the bunk on the far side of the control room, to Mary Seabrook's side. Her shoulders were shaking with stifled sobs. Gilbert touched her tenderly.

"It's all over, Mary," he breathed. "Just as he planned. He went out swiftly, cleanly. The way he wanted to go. God will be kind to him, I know—"

Mary turned to him, put her head to his shoulder and sobbed. In that moment, I understood that these two had been destined for each other from the beginning of time. I had been a blind fool not to have seen it before.

He led her away, back to her cabin. But not before she had turned to me and said, "I'm sorry, Mike—those things I said. I know you did what was right—what father told you to do. Try and forgive me—"

GILBERT came back in a few moments and put his hand on my shoulder. "Yes," he said tiredly. "He fixed it so it would explode. But he did more than that—he destroyed the entire Lubian population. . . ."

"Not all of them," I corrected. "He couldn't have killed them all. Just a few—those around the machine—"

"No. He killed them all. That weapon was never built to disintegrate—Seabrook let them think that so they would allow him to build it. Rather, it performed exactly the opposite function. That of a reducing ray.

"You see, the atmosphere of the Lubians was nitrogen tetroxide. And that gas is what we call 'unstable.' By that I mean that the atoms of nitrogen and oxygen in each molecule of the gas are not closely united. The same condition exists in such explosives as gunpowder and gasoline vapor.

"The reducing ray created an electrical field that split two of the loosely united atoms of oxygen away from each molecule of the gas. The molecular change was instantaneous, causing a terrific explosion of all the gas. And this change is the same in principal as the one that takes place in the explosion of gunpowder and gasoline vapors. Simply put, he exploded the atmosphere of the Lubians—not a single one of them could be left alive by any quirk of fate.

"The Jovians were not harmed, for they did not breathe the gas and were protected from the explosion in their domed cities. Seabrook saved them, saved us, and probably the universe from the scourge of the Lubians—and he was more than willing to give his life to do it. . . ."

●

STANLEY G. WEINBAUM, JOHN TAINE, EANDO BINDER, DR. EDWARD ELMER SMITH, JACK WILLIAMSON, DR. DAVID H. KELLER, JOHN COLEMAN BURROUGHS and HULBERT BURROUGHS, OTIS ADELBERT KLINE

—in the Next Issue of

THRILLING WONDER STORIES

FIRST PRIZE-WINNER

THE BROKEN AXIOM

The Laws of Physics State That Two Bodies Cannot Occupy the Same Space at the Same Time—but Dr. Halday Finds a Loophole!

By ALFRED BESTER

IT was a fairly simple apparatus, considering what it could do. A Coolidge tube modified to my own use, a large Radley force-magnet, an atomic pick-up, and an operating table. This, the duplicate set on the other side of the room, plus a vacuum tube some ten feet long by three inches in diameter, were all that I needed.

Graham was rather dumfounded when I showed it to him. He stared at the twin mechanism and the silvered tube swung overhead and then turned and looked blankly at me.

"This is all?" he asked.

"Yes," I smiled, "It's about as simple as the incandescent electric lamp, and I think as amazing."

"As amazing!" He gulped a little. "My dear Doctor Halday, you're too modest."

"No . . . please don't misunderstand me. Many people are under the impression that the apparatus which performs a scientific marvel must, of necessity, be extremely complicated. Edison's inventions wrought breathless wonders, yet they were very sim-

MEET THE AUTHOR OF THIS PRIZE STORY

Alfred Bester

IN selecting Mr. Bester's story as the winner in our contest for amateur writers, we were impressed, in the first place, by the excellent technique and style employed by its author.

We want emphatically to encourage writers like Mr. Bester, who have the knack of developing an interesting story that carries you breathlessly through its incidents and comes to a natural climax. (For further details concerning our Amateur Contest, see Science Fiction League Department.)

Mr. Bester is twenty-five years old, and has been an enthusiastic follower of science fiction for over a decade. He is a graduate of the University of Pennsylvania, where he majored in music, physiology, art and psychology. At present he is associated with a publicity office.

Hobbies: Telescope making, painting, photography, playwriting, composing, and interpreting James Joyce. If he had his choice of the arts to follow, he would without doubt, he says, select all seven—or however many there are.

ple. That is, simple to understand once they had been conceived. It is the conception that involves years of calculation; the execution usually is quite simple."

"And this?"

"This is another simple execution. Here we have on the one side, a transmitter; on the other, a coherer. You will notice that they are twin mechanisms connected by the vacuum tube overhead. A subject is placed on the transmission table and is subjected to the field of a Radley magnet which 'spreads' the individual atoms an infinitesimal fraction. Simultaneously, a beam from this Coolidge tube bombards the subject, section by section, tearing off the atoms one by one. These are deflected to the atomic pick-up where a smaller magnetic field directs them through the vacuum tube to the receiver. There the entire process is reversed and the subject recreated on the coherer table."

I stepped over to the switchboard and snapped on the dynamo. As the low hum purred through the room and the long line of storage batteries flanking the wall, began to charge; I started the tedious check-up that always must precede an experiment. Graham watched me with a glassy stare. Evidently what I had just told him had come as a violent shock. He muttered something to himself and at last interrupted my work.

"I say— Doctor Halday!"

"Yes?"

"Where do I fit in?" His voice broke with excitement. "After all, I'm only an instructor in electrical engineering and—"

I finished setting the Coolidges and straightened up to look at him mildly.

"The fact is, Graham, I need a subject. That's why you're here."

"A subject? But it may be dangerous."

"Precisely. For that reason I could never ask anyone to submit to the process. I've got to do it myself. I asked you to help because someone must operate the switchboard."

In horror I saw that I had sunk through the floor to my knees

GRAHAM waved his arms wildly. "Doctor Halday, what's the need for a human subject? You tell me you've sent several dogs through. Isn't that enough?"

I shrugged with irritation at his logic. Graham is a sound man with a fine mind, but I believe he is absolutely devoid of emotion and imagination. He could never understand my almost insane desire to transmit a human being through the apparatus. Somehow, the successful experiment on the human subject seems to stand as the final goal of success. Anything short seems paltry in comparison.

It was useless to convey my sentiments to him. Wordlessly I completed the round of inspection, and at last ran down to the stock room brought up a small white rat which I handed to Graham.

"Anesthetize." I said shortly. "You'll find ether and cotton on my desk." I bent over the control panel and adjusted the disintegration and coherer dials. "The mechanism must be adjusted to the size of the subject," I called over my shoulder, "There's no sense in wasting power. I'm going to put the rat through as a final check-up. Then it's my turn."

Graham soon had the animate bit of white fluff quite unconscious. I placed it on the transmission table and focused the Coolidge. Once again I looked over the dials, this time making the adjustment with a strong magnifying glass.

"This is the most important feature of the operation," I said. "I want you to make a special note of it. Unless the sets are tuned precisely alike, the specimen will not be transmitted. Compare it to the radio, if you like. For unless the receiver is tuned to the wave length of the broadcast, you will receive nothing but static. Or at best, a blurred reception. All right, now come and stand beside me. I want you to get a working idea of the technique."

We went to the control board where I cut the generator switch bringing a sudden stillness over the room. Then, taking my stop watch in hand, I threw the arm that set the Radley going. As the high whine of the magnet echoed through the room, I counted off ten seconds by the clock and set the Coolidge into operation.

A frightful, crackling discharge sounded in our ears, and out of the corner of my eye I noticed that Graham jumped at the suddenness of it. The entire disintegration system was bathed in a green luminescence, and the small white form now lay in a pool of emerald light which slowly increased in brilliance. I glanced again at Graham and saw him staring intently at the operating table. Little beads of sweat cascaded down his face to his lips where they were licked away by his nervous tongue.

When the aura that covered the white rat at last became almost too intense for the eye to bear, I turned my back and studied the watch dial. At the sixty-second mark I threw the coherer switch, and the mechanism at the other side of the room leaped into brilliant radiation. I poked Graham violently.

"She's going through," I informed. "Watch her."

ON the far table a nucleus of sparkling green formed and spread slowly until it made a small pool. Gradually it deepened in color, the dartling specks of fire faded away and a dark cocoon took shape in the centre. Two minutes had already passed and I was forced to direct my attention to the stop watch. The last sixty seconds that I counted out seemed to be sixty minutes. My voice trembled as I shouted the numbers aloud to get the rhythm, and my hand shook as I reached forward toward the panel. I counted five, then four, three, two, one, and on the zero snapped the break switch that cut the operation and left the room in a deafening silence. I sighed and wiped my brow feebly with my grimy hand.

"There's something about this process that gives me a slight fright, no matter how many times I do it!" I said.

Graham never heard me. Unable to restrain his impatience, he rushed over to the second table and stared

down. There on the coherer lay the small white rat, twitching gently in her sleep, whole and unharmed. There was an overpowering odor of ozone in the air.

"What do you say now?" I asked.

For an answer Graham reached out and poked the animal gingerly. Then, mustering his courage, he picked it up and examined it carefully. At last he turned to me.

"Absolutely incredible!" He breathed.

"Fine!" I patted him heartily on the back. "Now let's prepare for the final transmission. It won't take long."

I started the dynamo humming again and began to prepare the apparatus for myself. As I worked, I kept up a running chatter of comment and advice to Graham, for I wanted to give him no chance to demur. I had already written out an instruction sheet for him to follow, and this I placed in his icy hand. He attempted to speak once or twice, but somehow could never grasp the opportunity.

Perhaps my interminable talk was due also to my own nervousness, for I confess that I was frightened. My hands trembled so that it was almost impossible for me to readjust the transmission and coherer dials, setting them to the proper readings. That and other minor irritations delayed me for some time. It must have been at least half past ten before I stretched out on the table and told Graham to get the ether.

"Do you have to use it?" he asked. "I'd feel so much better if I knew you were awake and watching me."

"I'm sorry," I answered. "But I don't know yet whether the operation is painless. It would be best to avoid the possibility of extreme discomfort. Now, come on. You know exactly what to do. Apply the ether."

He gave a worried smile and patted me on the shoulder. It seemed to take him a million years to prepare the ether cone and set it over my nose; and about another million to drip the first sickly smelling drops on the cotton wadding. For the briefest second I had an almost uncontrollable desire to sweep the cold metal from my face and rush out of the laboratory. My ears roared and heavy hammers pounded on my head. With an agonized effort I raised one arm to halt Graham. Lifted the heavy arm inch by inch for an endless space of time. . . .

WHEN at last my hand reached my face I realized that I was coming out of the ether. For a moment I lay quietly, trying to calm my violent illness. The realization that I was whole and conscious told me, with a triumphant surge, that the experiment had been successful. For one more instant I lay quiescent, savoring the first joy of my success, then happily I rolled over and opened my eyes. The blow came with shattering effect. I could see nothing.

I was not quite in total darkness, for as my eyes adjusted to the altered surroundings, I was able to make out the dim outlines of the laboratory. It was as though I had a pair of heavily darkened glasses before my eyes. There was no color, no high light, no brilliance. All things were a uniform dim gray, gray dark and silent.

It came to me in a flash that I could not hear the faintest sound. I could just make out the window shade flapping slowly in the evening breeze, but I could not hear the clack that should accompany it. My eye traveled to the sink in the corner and I noticed that someone had left the water running, but I could not hear it.

I raised my fist to pound it against the table on which I lay, hoping to hear the thud, but when I smacked it down smartly, I received the greatest shock of all. My hand passed smoothly through the metal until my arm was buried to the elbow.

I was so amazed as I drew it out that I did not see Graham come rushing back into the lab, a glass in his hand. At any rate I didn't hear him slam the door. He came up to me and I could see dimly that his face was distorted with fear. He opened his mouth, said something and then waited. I shook my head in despair.

"I can hardly see you, Graham," I shouted, "much less hear you." My voice sounded strangely thin and muf-

fled.

He stared at me for a while and then said something else. I threw up my hands in disgust, but with astonishing results, for the reaction to the gesture drove my posterior six inches through the table. I struggled up and out much as one scrambles out of deep snow, and slid to the floor up to my ankles.

I hadn't much weight, I discovered. It seemed from the heft of my body that I didn't gross more than a hundred pounds. I felt myself gingerly and found to my relief that at least I was solid to my own touch. At last I looked up and perceived Graham hovering dimly in the distance. From the squinting look on his face I took it that I was as nebulous to him as he to me.

We must have squinted at each other for some time as we began to realize what a hopeless situation it was. It was desperately necessary that I get back to a normal state as soon as possible. I stood and thought very hard, probing for the reason for the mishap. Evidently I had failed to adjust the coherer precisely to the transmitter. My nervous hands had probably been responsible.

The net result was that instead of being transmitted and recreated in the correct order, the integral atoms of my system were slightly altered in position. Not quite sufficiently to remove me altogether from our own space system, but enough to enable me to co-exist with any ordinary solid in the same space at the same time.

From my weightlessness and my ability to thrust myself through objects, I judged that the atomic structure had been spread slightly. Apparently gravity could not exert its full force on me, but I became conscious of what force it had in another moment. In horror I saw that during my reflections I had sunk through the floor to my knees.

THE expression on Graham's face was laughable when he saw me plow my way up to the top of the floor. It was an extremely difficult task, not because of the resistance of the wood, but because I had nothing upon which to obtain purchase. I felt like a man in a quagmire and as Graham hovered about me like a mother hen, his position was as ludicrous as mine. Each time he instinctively tried to pull me up by the arm his hand passed right through me as though he were trying to pick up a handful of molasses.

On the whole, it was a good thing for us, for we both chuckled a little and regained some composure. I found that if I kept moving I could avoid sinking through the floor, and Graham discovered, after some fooling around, that we could see each other a little better in a red light. He sat down at the desk, took some paper and a pencil and began figuring. I paced and thought some more.

The sound came just before the crimson cloud appeared. It was a high-pitched vibration, incredibly thin and far, and it sent cold shivers down my spine. I swirled about and peered intently through the gloom in the direction from which I thought the sound had come. I stood alert for several moments, my senses keening for that unearthly cry, but it was not repeated. Then, just as I was about to relax and turn my attention back to Graham the red cloud appeared.

It snapped into existence quite abruptly, a tiny mass of flaming nebulosity, and hung poised far in the distance. It looked like nothing I had ever seen before, and somehow it sent a clutch of horrid dread through my heart. I glanced hastily at Graham, anxious for what little dim companionship I could obtain from him in my lonesome isolation, but he was working away at the desk, oblivious to all.

Some intuition told me that the crimson cloud was a life form. I was positive of that. It had an ameboid motion that bespoke a living intelligence. Although it was far off, I could see the fluctuations of color, the quick graduations from deep red to pale pink, the sparkling gleam of vitality. It remained, gently twisting and convoluting for two or three minutes, and then vanished as abruptly as it had appeared.

Suddenly I began to tremble. It

was bad enough that I was a thing not of my own world, bad enough that I was faced with a ghastly prospect of slow, lonesome starvation; but now I was beginning to realize that there were other dangers in this half-way world. Apparently there was more than one world to consider.

I had never thought that the old axiom could ever be broken: "Two things cannot occupy the same space at the same time." Yet here I was in the very act of disproving it, and I was learning to my horror that there were other beings accompanying me.

I reflected that it was much like the case of several radio broadcasts occupying the ether at the same time, not interfering with each other because of their varying frequency. I knew that I was not of the same frequency as the normal earth, and I prayed that I would be just as unsubstantial to these crimson clouds.

SUDDENLY the thin vibrating sound began again. This time it slowly increased in intensity and lowered in pitch until it became a low, pulsating throb. I stood motionless, unable to move, unable to think, filled with a horrible anticipation. Then, as the sound died away, a multitude of crimson clouds suddenly appeared in the distance.

They snapped on much as a series of lights are switched on at a control board, and took up a steady advance in my direction. The pulsations had died out when they reached me and yet their path had a thunderous quality for all the awesome silence. They glided past me, fiery crimson amebas, great twisting clouds, apparently without knowledge of my presence. I was breathing a sigh of relief when there came a shrill, cold scream, and all vanished.

Then I became conscious of the *impact*. It was something impossible to describe, for it affected none of the known senses. Perhaps it was only intuition, but I knew that I was being inspected by something. I quivered under the slice of those intellectual knives and the small hairs on the back of my neck twitched under that unendurable silent appraisal. That, and the ominous suspense.

I suppose I became hysterical at this point, for I turned violently and began to run. I dashed madly through the wall of the lab, out into Hamilton Walk, past the school dormitories to Woodland Avenue. It was a queer progress, although I was too far gone to enjoy my ability to speed through solids. I dashed wildly through a street car, smashed through the side of an apartment house smack into a dinner party. I remember how startled I was as I ploughed through that dinner table without so much as jarring a glass of water, but I hadn't a sense of humor just then.

And all the while I ran, in that semi darkness, I was conscious of the same intolerable scrutiny. It whipped me to the point of insane terror; it spurred my screaming nerves to frantic action; it racked my entire system with an unendurable horror until I was no more than a flailing structure of bone and muscle. I shut my eyes as I ran, the same way a child, afraid of the darkness, closes its eyes to keep it out.

When at last I was too exhausted to run, too exhausted to feel anything more than a dull fright, I pulled up sharp and opened my eyes. My heart was pounding in my ears and my chest was pumping in frightful heaves. But I was alone at last, and it seemed awfully good just to be alone.

But as I was regaining a little confidence and soothing my jumpy nerves, I sensed with another frightened start, that the low pulsation had once more begun. I listened intently, hoping that I was merely hearing the beat of my own pulse, but there was no room for doubt. I took a deep breath and looked about frantically, hoping for some means of escape, and then was almost blinded by a sudden onslaught of crimson clouds.

They surrounded me with their flaming brilliance that radiated no particle of heat; bombarding me with their chill, forceful intelligence that was all the more frightening for its unfamiliarity. They were alien, incomprehensible beings made gro-

tesquely horrible because they were outlined by the dim familiarity of my own native streets.

ONCE again that terrible scrutiny began, but this time it had purpose and direction. I could feel that they were vainly attempting to fathom, to analyze me and sum me up. I stood there sullenly, without the vaguest idea of what to do. Then, unaccountably, I screamed and jabbered a few broken sentences. They were the jumbled words that I had last spoken to Graham and I realized that I had been stimulated by these beings to speak.

One by one, they took my senses apart, the way a curious child tinkers with a clock. I spoke, I blinked, I breathed. I brandished my arms in inconceivable positions, walked, ran, sat, stood. Then when they had finished with my machinery they began tinkering with my mind.

I multiplied and divided for them, worked out the quadradic theory and illustrated a few Euclidian propositions. I worked out syllogisms and reviewed the history of the American Revolution. It seemed to me that I had never in all my life done so much haphazard thinking as I did in those few minutes.

It was the haphazardness that gave me my first hopes, that and my ability to retain a conscious objectivity. At first I had feared that in some way these creatures might try to harm me. Now I realized that I was as incomprehensible to them as they to me. They were operating my various mechanical parts the way a savage might toy with an automobile, without the faintest notion of the general nature and purpose of the mechanism.

They were pulling my levers and spinning my wheels without comprehension; nor could they ever hope to understand me, for we were of two different worlds. Best of all, however, was the fact that they could not reach certain portions of me. They could not affect my consciousness, my ego. At least I could retain my identity so that when they tired of the play perhaps I might slip away and...

The crimson clouds blinked out, and I sighed with relief. Then I gasped with fear, for I could feel myself moving. That is, I thought I was in motion. My body told me that it was being shifted about rather violently and I could feel my stomach tickle the way it always does when I am suddenly raised or lowered; but I could see from my dim surroundings that I was not moving.

The streets remained steadfast and still, and as far as my world was concerned I had not budged from the corner of 34th Street and Chestnut. It came to me, then, that these creatures were either progressing in a space that had no relation to ours, or else they were standing still and moving space around them. Either theory was possible and either would account for the paradox of my senses.

I tried to fend off for myself, but I found that I could not move a muscle. Just how I had been fastened down this way I could not tell, but it seemed that I had got the idea when first the animated clouds began their dissection.

THE motion continued for some time, a hurtling, jolting progress that knocked the wind out of me. Once in a while I could see human figures walking down Chestnut Street and it gave me an awful sense of futility to realize that I was only a few blocks away from the familiarity of my laboratory and yet so confounded distant.

At last the mad journey ceased and once again the low vibration that somehow was connected with their appearances, sounded in my ears. Then the blackness was transformed into a scarlet furnace and I found myself completely surrounded by crimson radiation.

"Doctor John Halday," I thought, without any volition on my part. I continued like an automaton, giving the details of my profession and the story of my life. Then, without continuity, I began an explanation of the basis and system of our life and at last launched into my theory about the relationship of these two worlds.

I told them that ours and theirs were co-existent in space, differing only in the matter of atomic structure and organization. As I continued in an elaboration of my explanation and a description of my transmission process, that little nucleus of ego in my brain that remained untouched wondered how many worlds there were that existed in the same universal space. I wondered whether it could be anything like those cunningly carved Chinese balls that contain many spheres, one within the other.

At last there came a pause and it seemed that those strange beings were attempting to digest and comprehend all I had told them. As I stood there, grateful for the comparative peace, I noticed them shudder once or twice with queer flaming contortions, and edge uneasily away. I could not for the life of me fathom what caused the discomfort, nor could I tell how I knew it was a discomfort.

Yet, somehow, there was an unmistakable air of irritation and fear in their nervous convulsions. They twitched again and those on my left drifted off to the right, leaving a small window of blackness in the crimson wall through which I peered intently. Then, far, far in the distance, I saw a small glow of greenish phosphorescence glimmer, and again there came that nervous shudder.

When I again turned to look at my captors, I saw that a change had come over them. All had taken up a swaying, hypnotic motion that almost forced me into a sympathetic, rhythmic swing. Then a single individual detached itself from the mass and slowly wafted in my direction. I stood, swaying numbly, and watched its gentle approach with a hopeless, panicky premonition. Slowly, the cloud drew close and gradually it threw its mantle about me. I felt no sensations at all at the contact, and could just sense the fall of its nebulous folds over my body.

Then the crimson cloud took up a confusing, whirling motion, spinning about the axis of my frame much the way a whirlpool of water spins over an opening vent. A burning thrust stabbed at my side and I looked down to see a bright red spot gleaming over my flank. It grew steadily in intensity and as it waxed I saw that the whirling cloud was diminishing in size.

I could not tell what the purpose of this was, nor did I bother to make any guesses. I only knew that I was in terrible danger of something, that the unknown quantity in these garish-colored amebas was something to reckon with.

I STARTED and strained to dash off for freedom. I knew that it was hopeless to run, but my instincts knew only flight for self-preservation. I contracted my muscles fiercely, tensed my legs, whipped my body about to move from that infernal spot. And slowly the crimson spot on my side deepened and spread and burned. I knew that I was chained down, that it was impossible to move.

Then that bit of untouched ego in my brain wondered if I was really bound, or if these creatures had merely impressed the fact on my mind. Whether in truth I was fixed in space, or whether this was a hypnotic fixation. I attempted to calm myself.

I repeated over and over that I was not bound in space, that I was free. Within my brain I could feel the grim conflict between the two ideas. I clung steadfastly to the conviction that I was free, willed to believe it, clenched my teeth over my tongue and tried to drive the conviction into my heart. Then, inadvertently, I took a step backward.

With that one step I knew I had a chance. I turned about and sped off through that little window of blackness. The agonizing red slash in my side burned, stung and clung persistently. I turned my head and saw that I was still surrounded by the red creatures. Yet when I peered intently through the gray mist I saw that I was slowly moving through the streets in the direction of the University.

Just then I saw that spot of green flicker up and die away. Simultaneously, I felt the gnawing pain in my side die away momentarily and then increase. There was that same shud-

der repeated by my crimson hosts, but I noticed that the small window of darkness had perceptibly widened. Abruptly I made a decision, decided to gamble on the fear the crimson clouds had of that unknown green menace. Perhaps it might be some greater horror of this world which I should shun along with the red people, that I could not tell, but I knew they feared it and I gambled on the chance that it would not hurt me.

I veered around in its direction and ran with every ounce of my strength. The ego-force of those lurid creatures pounded in my brain, telling me that it was useless to flee, useless to do anything but submit. As I persisted, growing more and more fatigued, they took up that note and drummed in my brain a song of tired futility. The red cancer had grown to enormous proportions and burned with a crucifying intensity. The persistent pulsation of defeat and futility throbbed in my brain, and still I kept on, battering my way along like a mad elephant.

The creatures swirled excitedly. I could sense a note of panic in the urgency of the messages that pounded through my head. I knew that they were in a deadly fear of that green radiation that flickered in the distance. Some of their terror was conveyed to me. But by now I was careening along the upper class dormitories and heading in the direction of Hamilton Walk.

THE sob of my whistling breath sounded like a death knell in my ears and it seemed that I couldn't continue much longer. Then, a scant hundred yards off, the light flamed up and glowed for a few seconds brightly. As it died away I realized that it was something from my own earth, something of my world which these creatures feared. For I had seen the dim outlines of a room in the medical school building, a small room on the second floor, illuminated in green.

The flaming robe burned over my body from neck to ankles as I climbed up the steps of the Medical building, not quite sure of what I was to do. It was impossible to pause even for an instant for I could not take the chance of being bound again. As I trotted through the marble lobby, wondering on which side of the building was that light, it flared up again almost directly overhead.

I cut over sharply to the left stairs and tried to think what might be going on upstairs that could create this device. I reached the first landing with a grim choking in my throat. I could hardly bear the savage knives that thrust through my head.

I plodded down the dark hall-way and wished to God that I could see well enough in the gloom to tell which of the labs was being used. I knew it was a matter of seconds now, for the grinding ache in my head was making me dizzy and I could feel my legs buckling under me. My head rang with weird sounds and I seemed to think and see red.

For an instant I had an evanescent sensation that I was beginning to comprehend the life and the structure of those crimson beings; then I saw the green light flicker up just beside me. Turning, I sprang and dived furiously, despairingly in its direction.

I seemed to pass through a mile of plaster and glassware. An unearthly shriek broke on my ears, and I caught a glimpse of crimson clouds twisting in tortuous shudders. I remember landing smack under an enormous X-ray tube and the astonished nose of Dr. Barton of the Roentgenology department. Then all went black.

I suppose I spent half an hour getting around to opening my eyes, but it was such a blessed relief to lie and hear the comfortable earth sounds again that I could not rush. When at last I did look about me I was so happy to see the cool white of the hospital walls and so overjoyed to feel the smooth sheets under my fingertips that I refused to wonder how I had got back.

I lay still, resting my tired body, and tried to convince myself that it had all been a rather remarkable fever dream. The sight of Graham's anxious face peering over the bed brought me down to earth with a bang.

"Hullo, Graham!" I said weakly. He smiled and nodded his head.

"Well? What went wrong?" I demanded.

"Nothing," he said. "Or everything; depending on the way you look at it."

"I'm pretty tired," I groaned. "You'll have to do the talking for awhile."

AND he began to talk. This boy whom I had once thought unimaginative had done the prettiest bit of thinking and some of the fastest work that I have ever heard of. When I had dashed out of my laboratory he had not bothered to try to follow. He had reasoned that something extraordinary must have driven me to such behavior, and that I probably would either return safely or look for help if in danger.

He knew that he alone could never find me in the city at night, so he phoned every man in the university whom he knew to be working that night and told them the story. Most of them thought he was drunk, but all of them were sufficiently impresed by the intensity of his voice to listen and to agree to watch for me.

Thus, when I fell into the X-ray room at the medical school, old Barton had been more or less prepared and had phoned Graham. I had to laugh when Graham ruefully described the labor of getting my unconscious body back to my lab.

"It was awful!" he said, "I got Barton and two others to help. We put you on a mattress and grabbed the corners. But you oozed through every minute and we would have to stop and roll you on again."

"Never mind about that!" I croaked, "Tell me, how in blazes did you reconvert me to a normal atomic structure? I thought I'd never get back."

"Oh, that was easy," Graham smiled, "Remember how I began figuring as soon as you regained consciousness after being put through?"

"Yes, yes . . . well?"

"I realized that I had no idea what your atomic structure was, so that it would have been impossible to set the transmitter to pick you up."

"I'm no freshman," I grumbled. "Why all the explanation?"

"Anyway," he continued, "even if I could have set the transmitter to disintegrate you properly, I didn't know the difference between your structure and the normal; so it was impossible to set the coherer properly to allow for the difference."

"Will you get to the point!" I cried. "Or must I guess?"

"All right!" he said hastily. "The answer came when I remembered you had said that the apparatus consisted of *two* duplicate sets. In other words I had a coherer and transmitter already adjusted to allow for the problematic differences because they had originally created it. The only trouble was that they were backwards."

"Backwards?" I asked.

"Why yes. Don't you see? The coherer was adjusted to your atomic structure but it should have been a transmitter. So I made it one."

"I thought so," I muttered. "You reversed the machine!"

"Sure!" He grinned. "Then the transmitter was already adjusted to reconvert you to normality, so I turned it into a coherer. It took me a helluva time to figure it out, but I had your notebooks with the wiring plan and—well, here you are, safe and sound!"

"Yes," I answered, trying to brush something from my eyes.

I was thinking of many things: Of the X-ray luminescence that had frightened away the crimson horde; of the small, small zone of safety created by that little glow; of the long trip from the medical building to my lab and the long wait until Graham had transmitted me back to normality and safety.

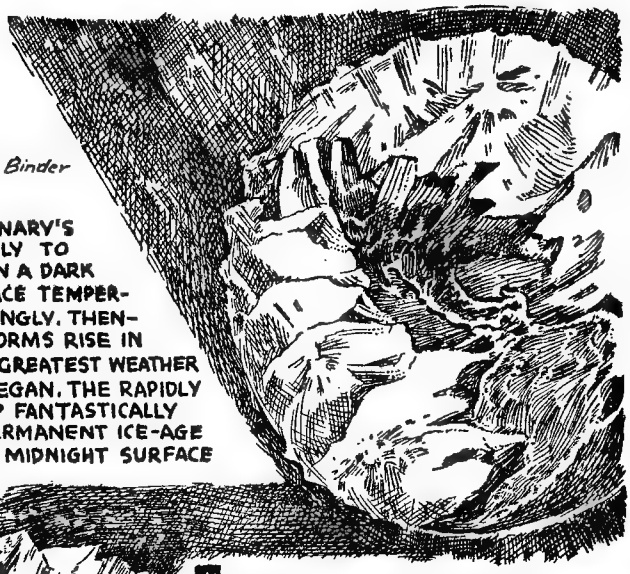
I was wondering what had happened to my body during that time, wondering whether it was fatigue or a crimson entity lurking in my soul that gave every object I saw a scarlet aura or haze.

"Yes," I answered, "safe and sound!"

SEE PAGE 105 FOR A SPECIAL ANNOUNCEMENT

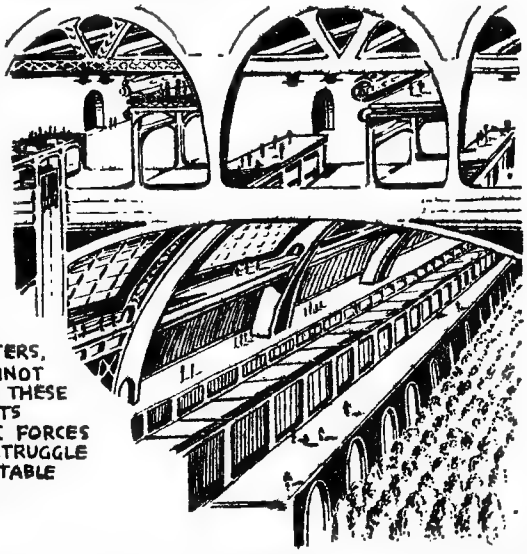
IF THE SUN WENT OUT!

BY Jack Binder



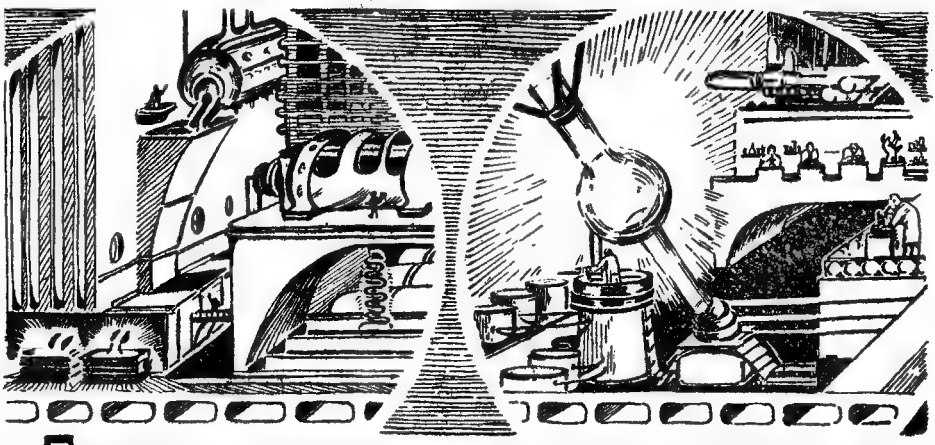
IF OUR CENTRAL LUMINARY'S ATOMIC-FIRES WERE SUDDENLY TO DIE OUT AND LEAVE OUR SUN A DARK "DEAD" STAR, EARTH'S SURFACE TEMPERATURE WOULD DROP ALARMINGLY. THEN—SNOW, SLEET AND HAIL STORMS RISE IN ELEMENTAL FURY, IN THE GREATEST WEATHER UPSET SINCE THE WORLD BEGAN. THE RAPIDLY FREEZING OCEANS PILE UP FANTASTICALLY WITH EXPANDING ICE. A PERMANENT ICE-AGE BEGINS, COVERING ALL THE MIDNIGHT SURFACE OF EARTH!

ALL HABITATIONS OF MAN ARE DOOMED. HIS MIGHTIEST BUILDINGS AND CITIES ARE CRUSHED BY THE IRRESISTIBLE ICE MENACE. HUMANITY'S NUMBERS MEET DEATH FROM FREEZING, STARVATION AND SELF-DESTRUCTION. IT IS A TIME OF HORROR AND DESPAIR, WITH NO DAWN TO CHEER HELPLESS SURVIVORS!



BUT SOME REMNANT OF MANKIND SAVES ITSELF BY BUILDING GIGANTIC SELF-CONTAINED UNDERGROUND QUARTERS, SIMILAR TO THOSE OF THE FRENCH MAGINOT LINE, DESIGNED AGAINST INVASION. IN THESE SUBTERRANEAN "CITIES", LIFE RESUMES ITS COURSE, SAFE FROM THE CATACLYSMIC FORCES ABOVE GROUND. IT IS A GRIM, HARD STRUGGLE IN A NEW ENVIRONMENT, BUT INDOMITABLE MAN SURVIVES IN HIS UNDER WORLD!

Next Issue: IF THE



THE SCIENTISTS, CONCENTRATING ON ONE GOAL, PERFECT ATOMIC-ENERGY FOR POWER. WHEN STORED FOOD SUPPLIES RUN OUT, CHEMISTS MANUFACTURE STAPLE PROTEINS, STARCHES AND SUGARS FROM BASIC ORGANIC MATTER. AIR, WARMED AND PURIFIED, IS PIPED DOWN FROM THE SURFACE IN HUGE CONDUITS. TRANSMUTATION PROVIDES NECESSARY METALS FROM COMMON ROCK MOLECULES. SCIENCE ANSWERS EVERY EMERGENCY OF BURIED MANKIND!

SAFE FROM EXTINCTION IN HIS NEW HOME, MAN DOES NOT FORGET THE SURFACE WORLD HE ONCE DOMINATED. EXPLORING PARTIES WANDER OVER THE FROZEN UPPER WASTES, WHERE LIFE CAN NEVER AGAIN GAIN A FOOTHOLD. RELICS ARE BROUGHT BACK TO BE PRESERVED AS MEMENTOES OF THE GREAT CIVILIZATION THAT ONCE EXISTED UNDER A WARM SUN!

THE ASTRONOMERS OF THE SUB-STRATA CIVILIZATION SEE AND CHART ONLY THE ETERNAL STARS WITH THEIR TELESCOPES. THE MOON AND PLANETS ARE NEVER MORE TO BE SEEN WITHOUT THE REFLECTED RAYS OF THE SUN TO LIGHT THEM. THE VANISHED GLORIES OF DAWNS, THE AURORA BOREALIS, RAINBOWS AND COMETS BECOME MYTHS!

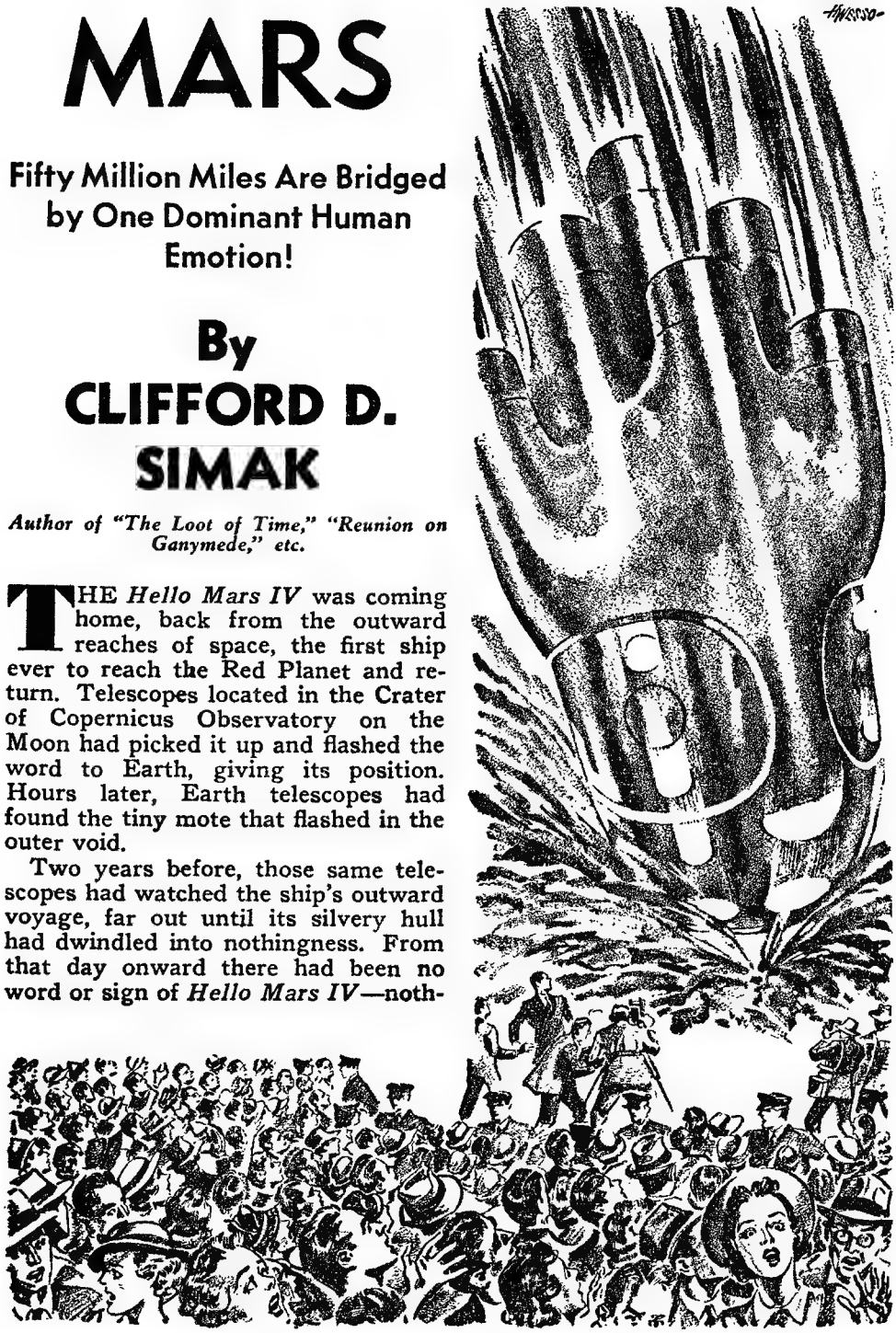
MOON FELL TO EARTH

MADNESS FROM MARS

Fifty Million Miles Are Bridged by One Dominant Human Emotion!

By CLIFFORD D. SIMAK

Author of "The Loot of Time," "Reunion on Ganymede," etc.



THE *Hello Mars IV* was coming home, back from the outward reaches of space, the first ship ever to reach the Red Planet and return. Telescopes located in the Crater of Copernicus Observatory on the Moon had picked it up and flashed the word to Earth, giving its position. Hours later, Earth telescopes had found the tiny mote that flashed in the outer void.

Two years before, those same telescopes had watched the ship's outward voyage, far out until its silvery hull had dwindled into nothingness. From that day onward there had been no word or sign of *Hello Mars IV*—noth-

"Look out!" roared a dozen voices and then the ship was down

ing until the lunar telescopes, picking up again that minute speck in space, advised Earth of its homecoming.

Communication with the ship by Earth had been impossible. On the Moon, powerful radio stations were capable of hurling ultra-short wave messages across the quarter million miles to Earth. But man as yet had found no means of communicating over fifty million miles of space. So *Hello Mars IV* had arrowed out into the silence, leaving the Moon and the Earth to speculate and wonder over its fate.

Now, with Mars once again swinging into conjunction, the ship was coming back—a tiny gnat of steel pushing itself along with twinkling blasts of flaming rocket-fuel. Heading Earthward out of that region of silent mystery, spurning space-miles beneath its steel-shod heels. Triumphant, with the red dust of Mars still clinging to its plates—a mote of light in the telescopic lenses.

Aboard it were five brave men—Thomas Delvaney, the expedition's leader; Jerry Cooper, the red-thatched navigator; Andy Smith, the world's ace cameraman, and two space-hands, Jimmy Watson and Elmer Paine, grim old veterans of the Earth-Moon run.

There had been three other *Hello Mars* ships—three other ships that had never come back—three other flights that had ended in disaster. The first had collided with a meteor a million miles out from the Moon. The second had flared briefly, deep in space, a red splash of flame in the telescopes through which the flight was watched—the fuel tanks had exploded. The third had simply disappeared. On and on it had gone, boring outward until lost from sight. That had been six years ago, but men still wondered what had happened.

Four years later—two years ago—the *Hello Mars IV* had taken off. Today it was returning, a gleaming thing far out in space, a shining symbol of man's conquest of the planets. It had reached Mars—and it was coming back. There would be others, now—and still others. Some would flare against the black and be lost forever. But others would win through, and man, blindly groping, always outward, to break his earthly bonds, at last would be on the pathway to the stars.

Jack Woods, *Express* reporter, lit a cigarette and asked: "What do you figure they found out there, Doc?"

Dr. Stephen Gilmer, director of the Interplanetary Communications Research Commission, puffed clouds of smoke from his black cigar and answered irritably:

"How in blue hell would I know what they found? I hope they found something. This trip cost us a million bucks."

"But can't you give me some idea of what they might have found?" persisted Woods. "Some idea of what Mars is like. Any new ideas."

Dr. Gilmer wrangled the cigar viciously.

"And have you spread it all over the front page," he said. "Spin something out of my own head just because you chaps are too impatient to wait for the actual data. Not by a damn sight. You reporters get my goat sometimes."

"Ah, Doc, give us something," pleaded Gary Henderson, staff man for the *Star*.

"Sure," said Don Buckley, of the *Spaceways*. "What do you care? You can always say we misquoted you. It wouldn't be the first time."

GILMER gestured toward the official welcoming committee that stood a short distance away.

"Why don't you get the mayor to say something, boys?" he suggested. "The mayor is always ready to say something."

"Sure," said Gary, "but it never adds up to anything. We've had the mayor's face on the front page so much lately that he thinks he owns the paper."

"Have you any idea why they haven't radioed us?" asked Woods. "They've been in sending distance for several hours now."

Gilmer rolled the cigar from east to west. "Maybe they broke the radio," he said.

Nevertheless there were little lines of worry on his face. The fact that there had been no messages from the *Hello Mars IV* troubled him. If the radio had been broken it could have been repaired.

Six hours ago the *Hello Mars IV* had entered atmosphere. Even now it was circling the Earth in a strenuous effort to lose speed. Word that the ship was nearing Earth had brought spectators to the field in ever-increasing throngs. Highways and streets were jammed for miles around.

Perspiring police cordons struggled endlessly to keep the field clear for a landing. The day was hot, and soft drink stands were doing a rushing business. Women fainted in the crowd and some men were knocked down and trampled. Ambulance sirens sounded.

"Humph," Woods grunted. "We can send space-ships to Mars, but we don't know how to handle crowds."

He stared expectantly into the bright blue bowl of the sky.

"Ought to be getting in pretty soon," he said.

His words were blotted out by a mounting roar of sound. The ear-splitting explosions of roaring rocket tubes. The thunderous drumming of the ship shooting over the horizon.

The bellow from the crowd competed with the roaring of the tubes as the *Hello Mars IV* shimmered like a streak of silver light over the field. Then fading in the distance, it glowed redly as its forward tubes shot flame.

"Cooper sure is giving her everything he has," Woods said in awe. "He'll melt her down, using the tubes like that."

He stared into the west, where the ship had vanished. His cigarette, forgotten, burned down and scorched his fingers.

Out of the tail of his eye he saw Jimmy Andrews, the *Express* photographer.

"Did you get a picture?" Woods roared at him.

"Picture, hell," Andrews shouted back. "I can't shoot greased lightning."

The ship was coming back again, its speed slowed, but still traveling at a terrific pace. For a moment it hung over the horizon and then nosed down toward the field.

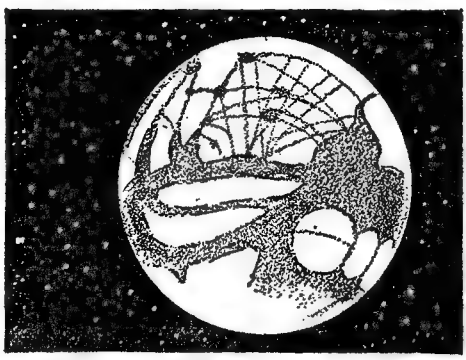
"He can't land at that speed," Woods yelled. "It'll crack wide open!"

"Look out," roared a dozen voices and then the ship was down, its nose plowing into the ground, leaving in its wake a smoking furrow of raw earth, its tail tilting high in the air, threatening to nose over on its back.

The crowd at the far end of the field broke and stampeded, trampling, clawing, pushing, shoving, suddenly engulfed in a hysteria of fear at the sight of the ship plowing toward them.

BUT the *Hello Mars IV* stopped just short of the police cordon, still right side up. A pitted, battered ship—finally home from space—the first ship to reach Mars and return.

The newspapermen and photographers were rushing forward. The crowd was shrieking. Automobile horns and



sirens blasted the air. From the distant rim of the city rose the shrilling of whistles and the far-away roll of clamoring bells.

As Woods ran a thought hammered in his head. A thought that had an edge of apprehension. There was something wrong. If Jerry Cooper had been at the controls, he never would have landed the ship at such speed. It had been a madman's stunt to land a ship that way. Jerry was a skilled navigator, averse to taking chances. Jack had watched him in the Moon Derby five years before and the way Jerry could handle a ship was beautiful to see.

The valve port in the ship's control cabin swung slowly open, clanged back against the metal side. A man stepped out—a man who staggered jerkily forward and then stumbled and fell in a heap.

Dr. Gilmer rushed to him, lifted him in his arms.

Woods caught a glimpse of the

man's face as his head lolled in Gilmer's arms. It was Jerry Cooper's face —but a face that was twisted and changed almost beyond recognition, a face that burned itself into Jack Woods' brain, indelibly etched there, something to be remembered with a shudder through the years. A haggard face, with deeply sunken eyes, with hollow cheeks, with drooling lips that slobbered sounds that were not words.

A hand pushed at Woods.

"Get out of my way," shrilled Andrews. "How do you expect me to take a picture?"

The newsman heard the camera whirr softly, heard the click of changing plates.

"Where are the others?" Gilmer was shouting at Cooper.

The man looked up at him vacantly, his face twisting itself into a grimace of pain and fear.

"Where are the others?" Gilmer shouted again, his voice ringing over the suddenly hushed stillness of the crowd.

Cooper jerked his head toward the ship.

"In there," he whispered and the whisper cut like a sharp-edged knife.

He mumbled drooling words, words that meant nothing. Then with an effort he answered.

"Dead," he said.

And in the silence that followed, he said again:

"All dead!"

THEY found the others in the living quarters back of the locked control room. All four of them were dead—had been dead for days. Andy Smith's skull had been crushed by a mighty blow.

Jimmy Watson had been strangled, with the blue raised welts of blunt fingers still upon his throat. Elmer Paine's body was huddled in a corner, but upon him there were no marks of violence, although his face was contorted into a visage of revulsion, a mask of pain and fear and suffering. Thomas Delvaney's body sprawled beside a table. His throat had been opened with an old fashioned straight-edge razor. The razor, stained with blackened blood, was tightly clutched in the death grip of his right hand.

In one corner of the room stood a large wooden packing box. Across the smooth white boards of the box someone had written shakily, with black crayon, the single word "Animal." Plainly there had been an attempt to write something else—strange wandering crayon marks below the single word. Marks that scrawled and stopped and made no sense.

That night Jerry Cooper died, a raving maniac.

A banquet, planned by the city to welcome home the conquering heroes, was cancelled. There were no heroes left to welcome back.

What was in the packing box?

"It's an animal," Dr. Gilmer declared, "and that's about as far as I would care to go. It seems to be alive, but that is hard to tell. Even when moving fast—fast, that is, for it—it probably would make a sloth look like chain lightning in comparison."

Jack Woods stared down through the heavy glass walls that caged the thing Dr. Gilmer had found in the packing box marked "Animal."

It looked like a round ball of fur.

"It's all curled up, sleeping," he said.

"Curled up, hell," said Gilmer. "That's the shape of the beast. It's spherical and it's covered with fur. Fur-Ball would be a good name for it, if you were looking for something descriptive. A fur coat of that stuff would keep you comfortable in the worst kind of weather the North Pole could offer. It's thick and it's warm. Mars, you must remember, is damned cold."

"Maybe we'll have fur-trappers and fur-trading posts up on Mars," Woods suggested. "Big fur shipments to Earth and Martian wraps selling at fabulous prices."

"They'd kill them off in a hurry if it ever came to that," declared Gilmer. "A foot a day would be top speed for that baby, if it can move at all. Oxygen would be scarce on Mars. Energy would be something mighty hard to come by and this boy couldn't afford to waste it by running around. He'd just have to sit tight and not let anything distract him from the mere business of just living."

"It doesn't seem to have eyes or ears or anything you'd expect an animal to have," Woods said, straining his eyes the better to see the furry ball through the glass.

"He probably has sense-perceptions we would never recognize," declared Gilmer. "You must remember, Jack, that he is a product of an entirely different environment—perhaps he rose from an entirely different order of life than we know here on Earth. There's no reason why we must believe that parallel evolution would occur on any two worlds so remotely separated as Earth and Mars.

"FROM what little we know of Mars," he went on, rolling the black cigar between his lips, "it's just about the kind of animal we'd expect to find there. Mars has little water—by Earth standards, practically none at all. A dehydrated world. There's oxygen there, but the air is so thin we'd call it a vacuum on Earth. A Martian animal would have to get along on very little water, very little oxygen.

"Well, when he got it, he'd want to keep it. The spherical shape gives him a minimum surface-per-volume ratio, makes it easier for him to conserve water and oxygen. He probably is mostly lungs. The fur protects him from the cold. Mars must be devilish cold at times. Cold enough at night to freeze carbon dioxide. That's what they had him packed in on the ship."

"No kidding," said Woods.

"Sure," said Gilmer. "Inside the wooden box was a steel receptacle and that fellow was inside of that. They had pumped out quite a bit of the air, made it a partial vacuum, and packed frozen carbon dioxide around the receptacle. Outside of that, between the box and the ice, was paper and felt to slow up melting. They must have been forced to repack him and change air several times during the trip back.

"Apparently he hadn't had much attention the last few days before they got here, for the oxygen was getting pretty thin, even for him, and the ice was almost gone. I don't imagine he felt any too good. Probably was just a bit sick. Too much carbon dioxide and the temperature uncomfortably warm."

Woods gestured at the glass cage.

"I suppose you got him all fixed up now," he said. "Air conditioned and everything."

Gilmer chuckled.

"Must seem just like home to him," he replied. "In there the atmosphere is thinned down to about one thousandth earth standard, with considerable ozone. Don't know whether he needs that, but a good deal of the oxygen on Mars must be in the form of ozone. Surface conditions there are suitable for its production. The temperature is 20 degrees below zero Centigrade. I had to guess at that, because I have no way of knowing from what part of Mars this animal of ours was taken. That would make a difference."

He wrangled the cigar from one corner of his mouth to the other.

"A little private Mars all his own," he stated.

"You found no records at all on the ship?" asked Woods. "Nothing telling anything at all about him?"

Gilmer shook his head and clamped a vicious jaw on the cigar.

"We found the log book," he said, "but it had been deliberately destroyed. Someone soaked it in acid. No chance of getting anything out of it."

The reporter perched on a desk top and drummed his fingers idly on the wood.

"Now just why in hell would they want to do that?" he asked.

"Why in hell did they do a lot of things they did?" Gilmer snarled. "Why did somebody, probably Delvaney, kill Paine and Watson? Why did Delvaney, after he did that, kill himself? What happened to Smith? Why did Cooper die insane, screaming and shrieking as if something had him by the throat? Who scrawled that single word on the box and tried to write more, but couldn't? What stopped him writing more?"

WOODS nodded his head toward the glass cage.

"I wonder how much our little friend had to do with it," he speculated.

"You're crazier than a space-bug," Gilmer snapped. "What in blue hell could he have had to do with it? He's

just an animal and probably of a pretty low order of intelligence. The way things are on Mars he'd be kept too damn busy just keeping alive to build much brain. Of course, I haven't had much chance to study it yet. Dr. Winters, of Washington, and Dr. Lathrop, of London, will be here next week. We'll try to find out something then."

Woods walked to the window in the laboratory and looked out.

The building stood on top of a hill, with a green lawn sweeping down to a park-like area with fenced off paddock, moat protected cliff-cages and monkey-islands — the Metropolitan Zoo.

Gilmer took a fresh and fearsome grip on his cigar.

"It proves there's life on Mars," he contradicted. "It doesn't prove a damn thing else."

"You should use a little imagination," chided Woods.

"If I did," snarled Gilmer, "I'd be a newspaperman. I wouldn't be fit for any other job."

Along toward noon, down in the zoo, Pop Anderson, head-keeper of the lion-house, shook his head dolefully and scratched his chin.

"Then cats have been actin' mighty uneasy," he declared. "Like there was something on their minds. They don't hardly sleep at all. Just prowl around."

Eddie Riggs, reporter for the *Express*, clucked sympathetically.

"Maybe they aren't getting the right vitamins, Pop," he suggested.

Pop disagreed:

"It ain't that," he said. "They're gettin' the same feed we always give 'em. Plenty raw meat. But they're restless as all git-out. A cat is a lazy critter. Sleeps hours at a stretch and always takin' naps. But they don't do that no more. Cranky. Fightin' among themselves. I had to give Nero a good whoppin' the other day when he tried to beat up Percy. And when I did he made a pass at me—me, who's took care of him since he was a cub."

From across the water-moat Nero snarled menacingly at Pop.

"He still's got it in for me," Pop said. "If he don't quiet down, I'll give him a raw-hidin' he'll remember. There ain't no lion can get gay with me."

He glanced apprehensively at the lion-run.

"I sure hope they calm down," he said. "This is Saturday and there'll be a big crowd this afternoon. Always makes them nervous, a crowd does, and the way they are now there'll be no holdin' 'em."

"Anything else you heard of going on?" Riggs asked.

Pop scratched his chin.

"Susan died this morning," he declared.

Susan was a giraffe.

"Didn't know Susan was sick," said Riggs.

"She wasn't," Pop told him. "Just keeled over."

RIGGS turned his eyes back to the lion caves. Nero, a big black-maned brute, was balancing himself on the edge of the water ditch, almost as if he were about to leap into the water. Percy and another lion were tusseling, not too good-naturedly.

"Looks like Nero might be thinking of coming over here after you," the reporter suggested.

"Shucks," snorted Pop, "he wouldn't do that. Not Nero. Nor no other lion. Why, them cats hate water worse'n poison."

From the elephant paddock, a mile or more away, came the sudden angry trumpeting of the pachyderms. Then a shrill squeal of elephantine rage.

"Sounds like them elephants was actin' up, too," Pop declared calmly.

Pounding feet thundered around the corner of the walk that circled the cat-cages. A man who had lost his hat, whose eyes were wild with terror, pounded past them. As he ran on he cried:

"An elephant has gone mad! It's coming this way!"

Nero roared. A mountain lion screamed.

A great grey shape, moving swiftly despite its lumbering gait, rounded a clump of bushes and moved out on the smooth green sward of the park. It was the elephant. With trunk reared high, emitting screams of rage, with huge ears flapping, the beast headed for the cat-cages.

Riggs turned and pounded madly

toward the administration building. Behind him Pop puffed and panted.

Shrill screams rent the air as early visitors at the zoo scampered for safety.

Animal voices added to the uproar.

The elephant, turning from his original direction, charged through the two acre paddock in which three pairs of wolves were kept, taking fence, trees and brush in his stride.

On the steps of the administration building, Riggs looked back.

Nero, the lion, was *dripping water!* The water that theoretically should have kept him penned in his cage as securely as steel bars!

A keeper, armed with a rifle, rushed up to Riggs.

"All hell's broken loose," he shouted.

The polar bears had staged a bloody battle, with two of them dead, two dying and the rest so badly mauled that there was little hope they would live. Two buck deer, with locked horns, were fighting to the death. Monkey Island was in an uproar, with half of the little creatures mysteriously dead —dead, the keepers said, of too much excitement. A nervous condition.

"It ain't natural," protested Pop, when they were inside. "Animals don't fight like that."

Riggs was yelling into a telephone.

Outside a rifle roared.

Pop flinched.

"Maybe that's Nero," he groaned. "Nero, that I raised from a cub. Bottle-fed him, I did."

There were traces of tears in the old man's eyes.

It was Nero. But Nero, before he died, had reached out for the man who held the rifle and had killed him with a single vicious blow that crushed his skull.

LATER that day, in his office, Doctor Gilmer smote the newspaper that lay open on his desk.

"You see that?" he asked Jack Woods.

The reporter nodded grimly. "I see it. I wrote it. I worked on it all afternoon. Wild animals turned loose in the city. Ravening animals. Mad with the lust to kill. Hospitals full of dying people. Morgues with ripped humanity. I saw an elephant trample a man into the earth before the police shot the beast. The whole zoo gone mad. Like a jungle nightmare."

He wiped his forehead with his coat sleeve and lit a cigarette with shaking fingers.

"I can stand most anything," he said, "but this was the acme of something or other. It was pretty horrible, Doc. I felt sorry for the animals, too," he said. "Poor devils. They weren't themselves. It was a pity to have to kill so many of them."

Doc leaned across the table. "Why did you come here?" he asked.

Woods nodded toward the glass cage that held the Martian animal. "I got to thinking," he said. "The shambles down there today reminded me of something else—"

He paused and looked squarely at Gilmer.

"It reminded me of what we found in the *Hello Mars IV*."

"Why?" snapped Gilmer.

"The men on board the ship were insane," declared Woods. "Only insane men would do the things they did. And Cooper died a maniac. How he held onto his reason long enough to bring the ship to a landing is more than I know."

Gilmer took the mangled cigar out of his mouth and concentrated on picking off the worst of the frayed edge. He tucked it carefully back into the corner of his jaw.

"You figured those animals were insane today?"

Woods nodded.

"And for no reason," he added.

"So you up and suspicioned the Martian animal," said Gilmer. "Just how in blue hell do you think that defenseless little Fur-Ball over there could make men and animals go insane?"

"Listen," said Woods, "don't act that way, Doc. You're on the trail of something. You broke a poker date tonight to stay here at the laboratory. You had two tanks of carbon monoxide sent up. You were shut in here all afternoon. You borrowed some stuff from Appleman down in the sound laboratory. It all adds up to something. Better tell me."

"Damn you," said Gilmer, "you'd

find it out anyway even if I kept mum."

He sat down and put his feet on the desk. He threw the wrecked and battered cigar into the waste-paper basket, took a fresh one out of a box, gave it a few preliminary chews and lit it.

"Tonight," said Gilmer, "I am going to stage an execution. I feel badly about it, but probably it is an act of mercy."

"You mean," gasped Jack, "that you are going to kill Fur-Ball over there?"

Gilmer nodded. "That's what the carbon monoxide is for. Introduce it into the cage. He'll never know what happened. Get drowsy, go to sleep, never wake up. Humane way to kill the thing."

"But why?"

"LISTEN to me," said Gilmer. "You've heard of ultrasonics, haven't you?"

"Sounds pitched too high for the human ear to hear," said Woods. "We use them for lots of things. For underwater signaling and surveying. To keep check on high-speed machines, warn of incipient breakdowns."

"Man has gone a long ways with ultrasonics," said Gilmer. "Makes sound do all sorts of tricks. Creates ultrasonics up to as high as 20 million vibrations per second. One million cycle stuff kills germs. Some insects talk to one another with 32,000 cycle vibration. Twenty thousand is about as high as the human ear can detect. But man hasn't started yet. Because little Fur-Ball over there talks with ultrasonics that approximate *thirty million cycles.*"

The cigar traveled east to west.

"High frequency sound can be directed in narrow beams, reflected like light, controlled. Most of our control has been in liquids. We know that a dense medium is necessary for the best control of ultrasonics. Get high frequency sound in a medium like air and it breaks down fast, dissipates. That is, up to twenty million cycles, as far as we have gone.

"But thirty million cycles, apparently can be controlled in air, in a medium less dense than our atmosphere. Just what the difference is I can't imagine, although there must be an explanation. Something like that would be needed for audible communication on a place like Mars, where the atmosphere must be close to a vacuum."

"Fur-Ball used thirty million cycle stuff to talk with," said Jack. "That much is clear. What's the connection?"

"This," said Gilmer. "Although sound reaching that frequency can't be heard in the sense that your auditory nerves will pick it and relay it to your brain, it apparently can make direct impact on the brain. When it does that it must do something to the brain. It must disarrange the brain, give it a murderous complex, drive the entity of the brain insane."

Jack leaned forward breathlessly.

"Then that was what happened on the *Hello Mars IV*. That is what happened down in the park today."

Gilmer nodded, slowly, sadly.

"It wasn't malicious," he said. "I am sure of that. Fur-Ball didn't want to hurt anything. He was just lonesome and a little frightened. He was trying to contact some intelligence. Trying to talk with something. He was asleep or at least physiologically dormant when I took him from the ship. Probably he fell into his sleep just in time to save Cooper from the full effects of the ultrasonics. Maybe he would sleep a lot. Good way to conserve energy.

"He woke up sometime yesterday, but it seemed to take some time for him to get fully awake. I detected slight vibrations from him all day yesterday. This morning the vibrations became stronger. I had put several different assortments of food in the cage, hoping he would choose one or more to eat, give me some clue to his diet. But he didn't do any eating, although he moved around a little bit. Pretty slow, although I imagine it was fast for him. The vibrations kept getting stronger. That was when the real hell broke out down in the zoo. He seems to be dozing off again now and things have quieted down."

GILMER picked up a box-like instrument to which was attached a set of headphones.

"Borrowed these from Appleman down in the sound laboratory," he said. "The vibrations had me stumped at

first. Couldn't determine their nature. Then I hit on sound. These things are a toy of Appleman's. Only half-developed yet. They let you 'hear' ultrasonics. Not actual hearing, of course, but an impression of tonal quality, a sort of psychological study of ultrasonics, translation of ultrasonics into what they would be like if you could hear them."

He handed the head-set to Woods and carried the box to the glass cage. He set it on the cage and moved it slowly back and forth, trying to intercept the ultrasonics emanating from the little Martian animal.

Woods slipped on the phones, sat waiting breathlessly.

He had expected to hear a high, thin sound, but no sound came. Instead a dreadful sense of loneliness crept over him, a sense of bafflement, lack of understanding, frustration. Steadily the feeling mounted in his brain, a voiceless wail of terrible loneliness and misery—a heart-wrenching cry of home-sickness.

He knew he was listening to the wailing of the little Martian animal, was "hearing" its cries, like the whimperings of a lost puppy on a storm-swept street.

His hands went up and swept the phones from his head.

He stared at Gilmer, half in horror.

"It's lonesome," he said. "Crying for Mars. Like a lost baby."

Gilmer nodded.

"It's not trying to talk to anyone now," he said. "Just lying there, crying its heart out. Not dangerous now. Never intentionally dangerous, but dangerous just the same."

"But," cried Woods, "you were here all afternoon. It didn't bother you. You didn't go insane."

Gilmer shook his head.

"No," he said, "I didn't go insane. Just the animals. And they would become immune after awhile with this one certain animal. Because Fur-Ball is intelligent. His frantic attempts to communicate with some living things touched my brain time and time again . . . but it didn't stay. It swept on. It ignored me.

"You see, back in the ship it found that the human brain couldn't communicate with it. It recognized it as an alien being. So it didn't waste any more time with the human brain. But it tried the brains of monkeys and elephants and lions, hoping madly that it would find some intelligence to which it could talk, some intelligence that could explain what had happened, tell it where it was, reassure it that it wasn't marooned from Mars forever.

"I am convinced it has no visual sense, very little else except this ultrasonic voice to acquaint itself with its surroundings and its conditions. Maybe back on Mars it could talk to its own kind and to other things as well. It didn't move around much. It probably didn't have many enemies. It didn't need so many senses."

"IT'S intelligent," said Woods. "Intelligent to a point where you can hardly think of it as an animal."

Gilmer nodded.

"You're right," he said. "Maybe it is just as human as we are. Maybe it represents the degeneration of a great race that once ruled Mars. . . ."

He jerked the cigar out of his mouth and flung it savagely on the floor.

"Hell," he said, "what's the use of speculation? Probably you and I will never know. Probably the human race will never know."

He reached out and grasped the tank of carbon monoxide, started to wheel it toward the glass cage.

"Do you have to kill it, Doc?" Woods whispered. "Do you really have to kill it?"

Gilmer wheeled on him savagely.

"Of course I have to kill it," he roared. "What if the story ever got out that Fur-Ball killed the boys in the ship and all those animals today? What if he drove others insane? There'd be no more trips to Mars for years to come. Public opinion would make that impossible. And when another one does go out they'll have instructions not to bring back any Fur-Balls—and they'll have to be prepared for the effects of ultrasonics."

He turned back to the tank and then wheeled back again.

"Woods," he said, "you and I have been friends for a long time. We've had many a beer together. You aren't going to publish this, are you, Jack?"

He spread his feet.

"I'd kill you if you did," he roared.

"No," said Jack, "just a simple little story. Fur-Ball is dead. Couldn't take it, here on Earth."

"There's another thing," said Gilmer. "You know and I know that ultrasonics of the thirty million order can turn men into insane beasts. We know it can be controlled in atmosphere, probably over long distances. Think of what the war-makers of the world could do with that weapon! Probably they'll find out in time—but not from us!"

"Hurry up," Woods said bitterly. "Hurry up, will you. Don't let Fur-Ball suffer any longer. You heard him. There's no way we can help him. Man got him into this—there's only one way man can get him out of it. He'd thank you for death if he only knew."

Gilmer laid hands on the tank again.

Woods reached for a telephone. He dialed the *Express* number.

IN his mind he could hear that puppy-ish whimper, that terrible, soundless cry of loneliness, that home-sick wail of misery. A poor huddled little animal snatched fifty million miles from home, among strangers, a hurt little animal crying for attention that no one could offer.

"Daily Express," said the voice of Bill Carson, night editor.

"This is Jack," the reporter said. "Thought maybe you'd want something for the morning edition. Fur-Ball, just died — yeah, Fur-Ball, the animal the *Hello Mars IV* brought in— Sure, the little rascal couldn't take it."

Behind him he heard the hiss of gas as Gilmer opened the valve.

"Bill," he said, "I just thought of an angle. You might say the little cuss died of loneliness . . . yeah, that's the idea, grieving for Mars. . . . Sure, it ought to give the boys a real sob story to write. . . ."

THE PRISONER OF MARS

A Complete Book-Length Novel of
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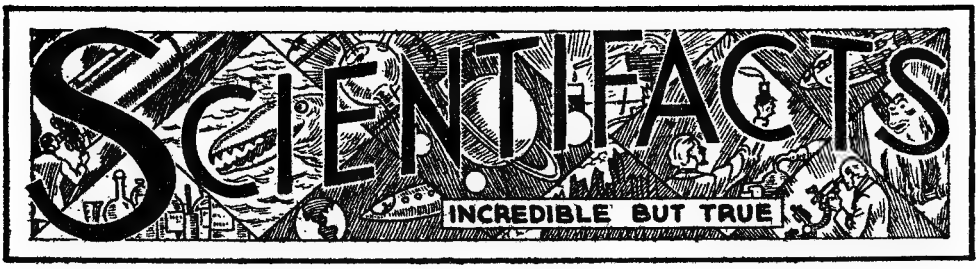
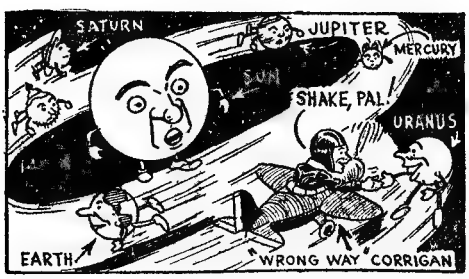


By J. B. WALTER

THE "CORRIGAN" PLANET

EIGHT of the planets in our Solar System rotate in the same direction around the sun. But there is one rebel planet!

The mutinous planet is Uranus. While the other eight planets circle the



sun in orderly, clockwise fashion, Uranus pursues its own independent orbit, counter-clockwise.

Astronomers can offer no reasonable explanation for this phenomenon. Here's a chance for some science-fiction writer to go to town.

THE BRAIN OF MAN

THE brain of man is the most highly developed and complex structure known in the Universe.

Professor C. J. Herrick, neurologist of the University of Chicago, has pointed out that the entire system of telephone switchboard and intercommunicating lines in the United States is a simple organization compared with that of a single human brain.

There are well over 10,000,000,000 brain cells or functioning units, microscopic in size, which make up the gray matter.

These are associated and interconnected in the most intricate fashion, and also connected with the various parts of the body by systems of gossamer-fine fibres.

Some day we may learn how to use each of these cells.

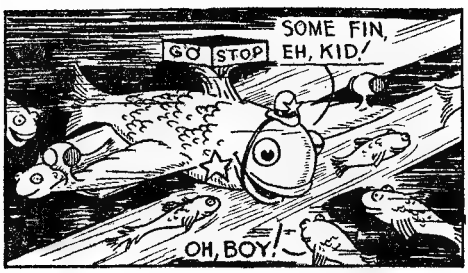
THE NAUTICAL NEON SIGN

A CERTAIN species of self-luminous fish carries its own headlights, and an assortment of vari-colored lighting effects!

No one can even hazard a guess as to what strange and amazing creatures may dwell in the depths of the ocean, for we know very little about the denizens of the sea miles below the surface. Miles beneath the surface of the sea is a world of Stygian blackness with intense cold and extremely high pressures.

And the dazzling lord of these depths is the strange trilight-fish. Along the sides of the trilight-fish are rows of golden-yellow lights. Back of each eye is a brilliant headlight.

Where the ventral fins should be are twin lights of yellow and red, while on



either side of the body is a patch of countless tiny lights which glow green or gold by turn.

The trilight fish would make a perfect marine traffic cop, with its red, green and amber-gold! The secret of its light?

Discover it—and make yourself a fortune.

THE 200-YEAR EXPERIMENT

SCIENTISTS began a certain experiment three years ago. It will take another one hundred and ninety-seven years to complete it!

The whole thing began three years ago at the University of Notre Dame. Six cultures of bacteria, sealed in glass test-tubes, were deposited in the cornerstone of a biology building, to remain there until the building is torn down, some 200 years in the future.

The object of the experiment is to determine whether certain types of microbes can exist outside of bodies for two hundred years. The bacteria were examined microscopically, and were shown to be in the spore state. So they have a good chance of surviving despite adverse conditions.

At any rate, posterity will get a glimpse of our "culture."

THE EYES HAVE IT

THE human eye is an actual electric battery—and really can generate electricity!

So reports Professor Walter R. Miles, of Yale University. The front part of the eye, Prof. Miles says, is electrically positive and the back part, containing the retina, has the opposite or negative charge. These differences in potential can be detected and measured by placing thin pieces of metal foil on the skin just above and below the eye and attaching the wires to extremely delicate voltmeters, after stepping up the current by means of a vacuum-tube hookup.

As the eye moves, differently charged areas are brought under the electrodes, and the fluctuations in the current appear on the dial. The amount of light contacting the eye at the time of measurement makes only a small difference in the result. In many cases one eye may differ sharply from its companion, just as people's features vary.

Minor visual defects seem to make little difference.

That the eyeball itself, and not the surrounding muscle, is the source of the current was learned when tests were conducted with individuals who were missing one eye.

If there is no eyeball, no current results, even if the socket has been fixed with a glass eye.

So when you say she has "sparkling eyes," look out for the shock.

THIS INCREDIBLE EARTH

ACCORDING to the American Physical Society, the Universe has a radius of 32,500,000,000,000,000,000,000 miles. This is equal to 350 billion times the radius of the Earth. . . . The fastest moving object in the Universe is a spiral nebula, which is apparently moving away from the Earth at the rate of 2,348 miles a second. . . .

The interior of the Earth is composed of molten glass at a temperature of 50,000 degrees centigrade and under a pressure of 50,000,000 pounds per square inch according to Professor Daly, of Harvard University. . . . It has only been luck that the large meteors that have fallen on Earth have landed in uninhabited parts of the globe instead of in large cities. There is nothing but chance to prevent one of these great masses of incandescent iron traveling at 20 to 70 miles a second from striking New York. . . .

You can measure moisture by radio! Scientists can do the trick with a device that is an application of an ordinary high frequency alternating current obtained by use of a radio tube. . . . If mankind is ever wiped off the map it will be due to an onslaught from the insect world, according to the New York State College of Forestry of Syracuse University. . . . Comets are not merely wanderers through space but are members of our own Solar System, according to astronomy's latest theory. . . .

WHITE BARRIER

A Great Wall of Mysterious Force Partitions the World Into Two Segments—and Never the Twain Shall Meet!

By FRANK BELKNAP LONG, JR.

Author of "Mind Out of Time," "We, the Invisible," etc.

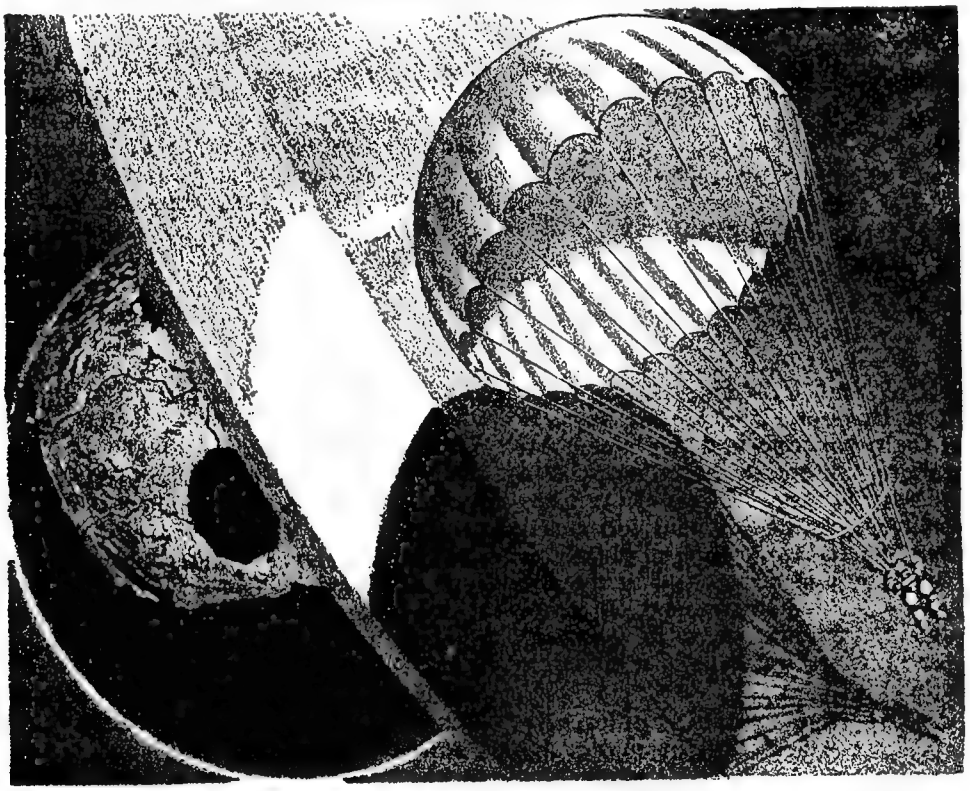
PROLOGUE

THE barrier arose mysteriously in the night. Across the Titan mountain ranges of Antarctica, across a black, lost, ice-encrusted continent where desolation reigned, it crept waveringly in darkness.

Across the Nordenskjold Ice Shelf and the Antarctic Archipelago, across sombre, gale-lashed seas to the Strait of Magellan, and then like a white serpent uncoiling over the mighty Andes, and across Bolivia, parts of Brazil, Venezuela, Costa Rica, to the Spanish Main.

The barrier was high and glistening and white. A nebulously weaving veil, it seemed to tower to the firmament as it passed over the starlit Caribbean and up the North Atlantic to the Gulf of St. Lawrence and the icy wastes beyond. Across Hudson Strait it crept between ice floes shattered by Thor's hammer and over the frozen, black soil of Baffin Island to Earth's northern pole.

But, to the east of that terrible, weaving veil there was no change in the familiar world. To the east were oceans, mountains, valleys and the habitations of men. To the east were sunlight and laughter and the song and flutter of birds. To the east the



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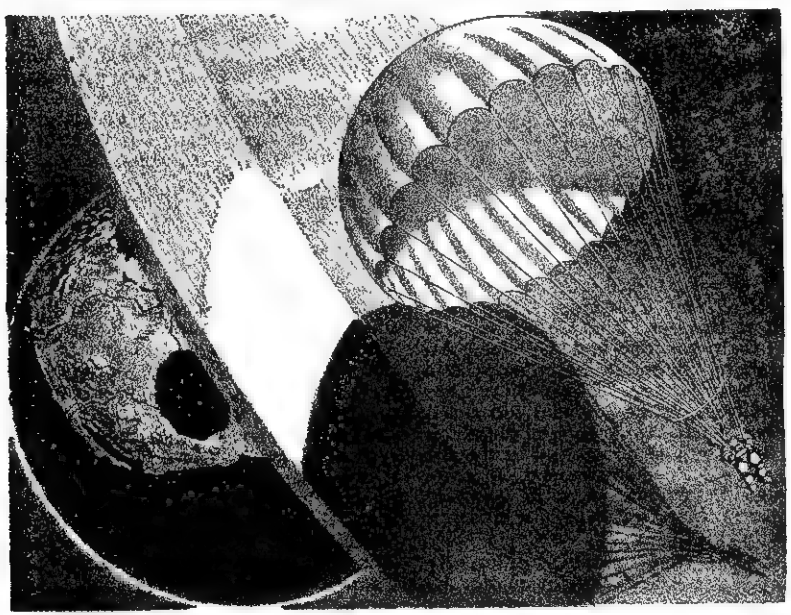
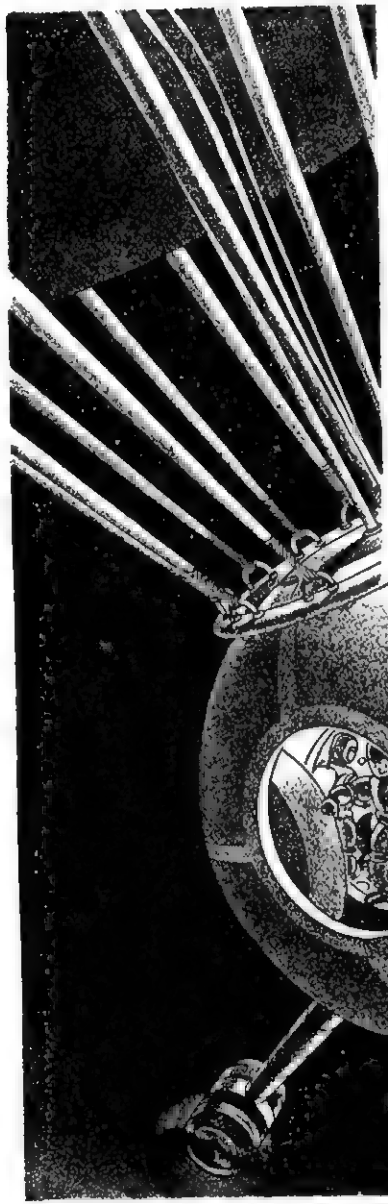


"Half the world has vanished! The earth beneath us has disappeared!"



A Complete Novelet of the Eighth Dimension

gray Atlantic, and Europe, Africa and most of Asia.

Europe's great cities remained. And all the little villages remained too, all the ivy-hung cottages and all the daisies in country lanes. All the old castles in the Pyrenees, the ruins of ancient Greece and Rome, the monasteries of Tibet in Asia.

But the barrier kept moving.

The great jungles still remained. The head-waters of the Amazon, Nepal and the Congo Basin. Lions, gorillas and sleeping sickness remained. The Pampas, Rio. And India, Persia and Siam.

Half the world remained. Teeming millions remained. Hundreds of millions of ordinary people and scientists, physicians, engineers, explorers, artists, scholars, soldiers. War remained. Greed remained. And the

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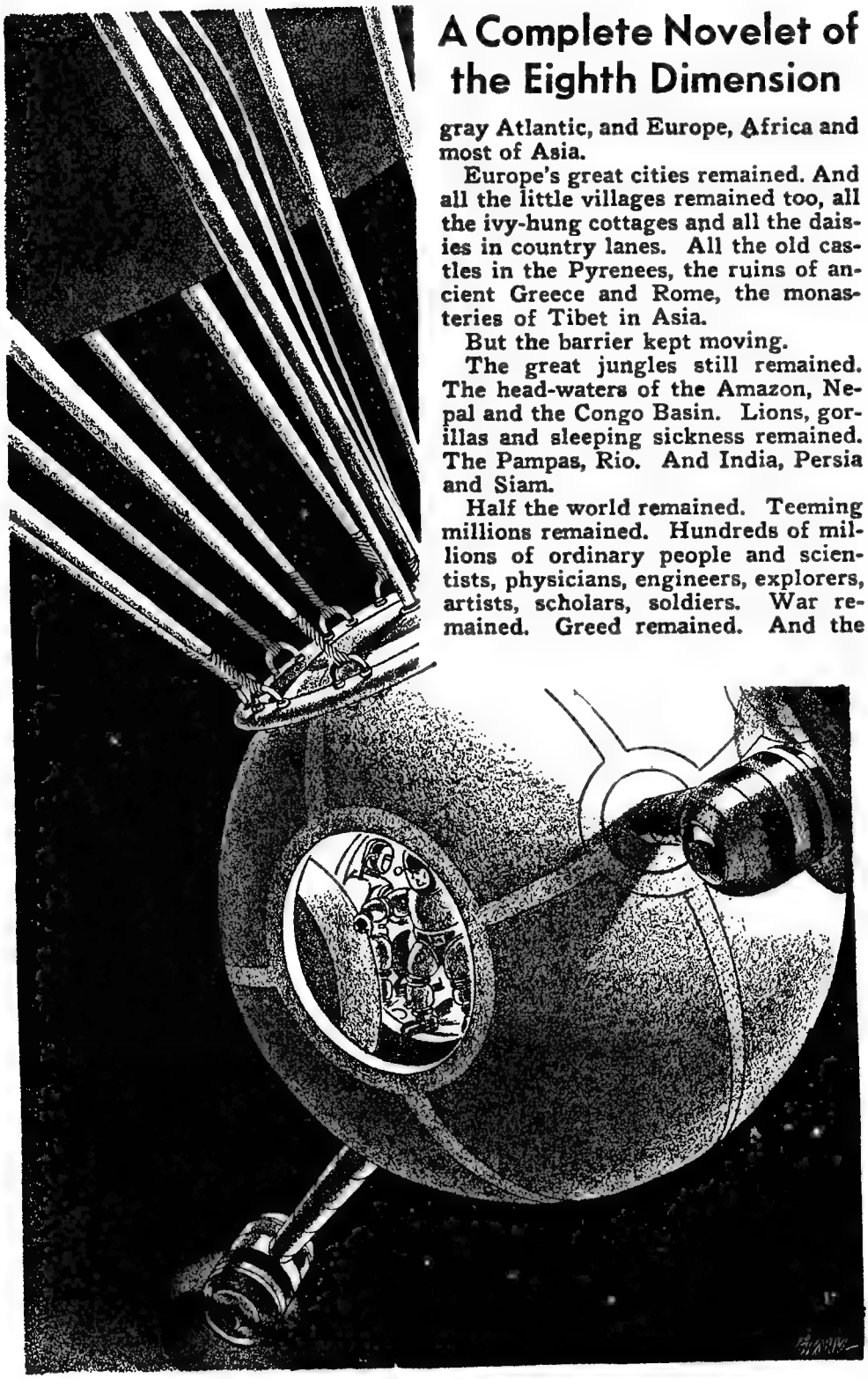

earth beneath us has disappeared!"

great moon still shone on lovers, and the despairing cries of the dying still echoed through the void.

The barrier did not stop at the pole. It crept southward across the frozen Arctic Ocean, and cut Siberia in twain. It moved relentlessly downward over Outer and Inner Mongolia and the great protuberant s a c k which is Southern China and out into the Indian main. Across two vast oceans it sped in sunlight now, a quivering wall of whiteness that hungered for Earth's southern pole.

Greedily it lapped at Australia's sunken reefs as it passed the Tropic of Capricorn, and the mists of a colder sea sped north to greet and embrace it. Across the Antarctic Ocean it swept on ghostly pinions, and over Wilkes Land's icy mountains and straight to its birthplace where it met itself in the swirling splendors of a newly risen dawn.

CHAPTER I

The Barrier

YOUNG James Powell's eyebrows were frozen solid. As he moved over the snow and ice his body felt remote to his consciousness and scarcely a part of him. All the warmth and radiance were concentrated in his mind. He moved mechanically, his heavy boots sinking deeply in the snow-blanket, trampling the dried-up Arctic sedges and lichens which clung to the icy soil.

His only companions in that gelid land were sentinel larch trees and barren-ground caribou. Overhead the stars blinked frostily in an aurora-laced sky.

Powell's breath froze as it left his nostrils; his lips were cracked, rime-flaked. His eyes were pale glacial hollows under his congealed brows.

He was a big man, raw-limbed, ungainly in his movements. His face was almost Indian in its impassivity. His big hooked nose was tipped with tiny icicles, his jaw was stoical and firm-set. He moved with a slow, lumbering gait, stopping from time to time to stare up at the northern lights and the far-flung constellations.

The words of a quaint old rhyme were running through his head when the cabin came into view:

> Ice on ice,
> And snow on snow,
> In the bleak mid-winter,
> Long ago.

"Ice on ice—" He smiled ironically to himself. It had occurred to him that the interior of Labrador in mid-winter was not as lonely as the Antarctic continent or Greenland's frozen braes. But the thought was scant comfort. It was almost as lonely, almost as cold.

Yet James Powell had more than a quaint old rhyme to comfort him. The joy in his mind came swiftly back like a rushing tide. All the windows of the little cabin toward which he moved were aglow with welcoming lights, kindled by Louise, his wife.

Louise Powell did not defy the blizzard nor tramp the pitiless, frozen waste. Her courage was of a quieter sort. A slender girl of nineteen, she shared her husband's self-imposed exile with unfailing good humor. She was self-reliant, resourceful and in all respects the exact opposite of the helpless type. Her gracious presence comforted James and gave him strength. Her love was a radiant cloak wrapping him round.

Powell's profession was a grimly exacting one. A government meteorologist, he labored long hours and waged incessant war with the elements in the bleak, cold outlands.. His salary was small; his tenure of employment uncertain. But James Powell hated cities and clerkships and adding machines. He was only happy when the wind and the stars conspired against him.

He was within hailing distance of the cabin when the door opened and his wife stepped out into the snow. She was wearing a coonskin coat and high leather boots, but her head was bare. She stood for a moment just outside the doorway, waving at him, her copper-colored hair ruffed by the wind, her face as radiant as the flambeaux of moon and stars and nebulously weaving aurora.

YOUNG Powell straightened. His eyes shone, and his big body shed its mechanical languor. He shifted the pack he was carrying and moved toward her with swift, purposeful strides.

She, too, advanced. Gladness at seeing each other, was in them both. And then—and then something white and glistening seemed to rise up between them. One instant Powell was striding forward, his arms extended hungrily. The next he was hurtling backward through the air.

The barrier seemed to rush toward him, to propel him through space with a sinister and terrible velocity. He landed on his back eighty feet away, coming down with a thud on the frozen soil. The fall to earth stunned him, jolted the breath from his lungs.

For a moment he lay helplessly groaning. There was a throbbing agony inside his skull, and the sound of the little stirring particles of snow and ice on all sides of him was magnified a thousandfold.

Hundreds of tiny, invisible hands seemed to be tugging at him, jerking erratically at his limbs as he struggled to a sitting position and stared about him.

His vision was blurred. But he was scientist and husband, and the scientist struggled to observe, the husband feared for his wife, and the scientific and marital emotions coalesced.

His faculties adjusted themselves slowly to the incredible change. Eighty feet from where he was lying a white and filmy immensity usurped all space before him. The barrier extended in a straight line north and south and thrust itself glisteningly upward into the sky. A cyclopean barrier of vapor-film that gleamed in the aurora-light, blotting out the cabin and half the stars of heaven.

The barrier had an obscure and appalling beauty. To the east of Powell gleamed the familiar, tundralike waste, the tumbled barrows of snow and ice, the immense circular patches of black, denuded soil. But to the west the firmament-towering barrier had swallowed up the world!

With a despairing cry Powell rose and staggered toward that nebulously shifting white veil, his puny hands upraised. The husband and lover were uppermost in him now, and like a man demented he hurled himself against the barrier, screaming his wife's name.

"Louise! Louise!"

But the barrier was impenetrable, unassailable. It stopped him in his tracks and sent him hurtling backward. A mysterious force seemed to emanate from it; an aura like an electric field that lifted him from the ground and sent him spinning.

HE regained his feet again, and came surging back. Again the gleaming barrier repulsed him. Ice and snow crackled under his feet as he assailed the balefully glistening film with relentless, never-tiring fury. A dozen times he attempted to hurl himself against it, to break through it. It was horrible to find that he could touch nothing tangible.

For the resistance he encountered was invisible and magnetic; a vibrant current-flow that caused his flesh to tingle as it lifted him from the earth and propelled him backward. The barrier both attracted and repelled him. Within an eight-foot radius its magnetic qualities were in the ascendant, but when he surged very close to it it repulsed him with vigor.

After a time his energies waned. He sank down in a crumpled heap on the glazed snow. Violent sobs racked him. He was conscious of being utterly, abysmally alone, and in the presence of a mystery so awful that his mind recoiled from its implications. All about him utter stillness reigned. He was enwrapped in a dead silence where nothing moved.

CHAPTER II

White Terror

HE was alone and yet not alone. In equally dead silence the little coastal town of Shallow Bay dreamed away the black midnight hours, and in the minds of those who slumbered there, were vague, subconscious stirrings—premonitions of disaster. That

high and terrible wall disturbed their sleep, perhaps with the same intangible magnetism which had repulsed the metorologist, Powell, at his outpost a day's trek away. But it was a magnetism diffused; spread out tenuously over the frozen land.

It was not until the following day that Shallow Bay awoke to the full horror of a world sundered from itself, enwrapped over half its length in a glistening, filmy shroud.

Shallow Bay was a little, fur-trading town with a white population numbering eighteen souls. The whites knew the impact of horror. But the two hundred Eskimos—having no radios—did not yet know that a great, white "mist-bird" had settled down on the land, dividing with its firmament-towering wings all the barren wastes.

The Eskimos a m b l e d sleepily through the wide, unpaved streets, between shacks ill-constructed and barren within, tar-papered against the weather's chronic inclemency.

Only the radios were vocal in that little t o w n, their static-distorted squealings merging with s p o k e n words in swift, frightening sequences as the day wore on, the long hours lengthening into a twilight that chilled men's souls, so bleak it seemed, so presageful of evil.

There were two radios in that little town. One was in the cabin of an eighty-year-old veteran furtrader named MacKenzie John, and the other, mellow-toned, belonged to the Canadian Government.

But the Government meteorologist who operated the latter set was not enjoying its tonal perfections. The messages which were coming in to him over the ether were too grimly appalling.

Duncan MacHeth was a big man, as gaunt in face and figure as his subordinate, young James Powell. He was perhaps twice Powell's age. His hair was snow-white, his weather-bronzed face heavily seamed with crow's feet and long, linear wrinkles. He was cumbersomely clad in a heavy, black furskin coat which had been improperly cured and gave off a peculiar musty odor. He was sitting on the porch rail, swinging his long legs nervously.

The radio was standing on the edge of the porch in reddening sunlight. From its built-in loud speaker came nothing but a succession of grimly staccato statements. No advertising cure-alls, no pauses for station announcements, no crooners, no swing music.

"THE entire North American continent lies beyond the barrier. With the exception of Maine, New Hampshire and Vermont, the United States has been swallowed up!

"The third Maine plane has just returned to the Portland airport. Having followed the vanished Atlantic coast south to Cape Hatteras, the pilots report that the barrier extends unbrokenly from Maine to North Carolina and beyond. Since the Bahama plane followed the barrier north to Maryland, we know that the entire Atlantic coast and Cuba, have been swallowed up.

"We do not know whether the barrier is a mile thick, or ten miles thick, or continent spanning. We do not know how far it extends into the sky. The planes could discern it unmistakably at a height of three miles, but at higher altitudes clouds and mist obscured visibility. There is a dangerous ceiling all along the vanished Atlantic coast.

"We speak of 'following the coast' because we assume that the coast is still in existence, but concealed by the barrier. But we have no proof that the coast, the whole of America, in fact, continues to exist behind the barrier.

"We cannot penetrate the barrier. The first Maine plane flew directly toward it and was hurled to destruction. The pilot of the second plane veered off just in time. He reports that the first plane burst into flames before it went into a tailspin.

"We have desperately attempted to break through the barrier here in Maine. We have attacked it with all the weapons at our disposal. We have sent radio-controlled cars and tanks against it. We attempted to pierce it with a machine-gun barrage. We attacked it with gas and chemicals. We

even tried liquid air and high-voltage electrical bombardment.

"It is conceivable that the barrier may be a conductor of undreamed of electro-magnetic tensions arising from its contact with Earth's crust. We know that it is deeply grounded, that it extends far beneath the earth. We have excavated deeply in its vicinity, have employed mining drills, subterranean blasts—"

The voice broke off suddenly. There was a static screech that rasped the Government meteorologist's ears, made his throat ache. The voice resumed:

"We are receiving messages from three radio stations in South America. Venezuela reports that scarcely more than a thin coastal strip of the South American continent lies behind the barrier. But the Venezuelan report is only geographically correct. Chile, Peru, Ecuador, and two-thirds of Columbia have been swallowed up. The great Andes mountain chain, far western Brazil—"

There was another static screech. "Canada," resumed the voice. "Virtually all of Canada is gone. Only Nova Scotia, Newfoundland and Labrador remain. The station at Halifax reports—"

There was another nerve-shattering interruption. But this time it did not come from the radio's loud speaker. It came from behind the Government man, from a sun-reddened patch of snow and ice just beyond the shack, and it caused him to swing about on the long porch rail with blanching features and staring eyes.

DRAGGING himself across the snow, his face a ghastly, pain-racked mask, was a sobbing, gibbering man. He was flat on his stomach in the snow. His long arms were outthrust and he was pulling his big body forward in slow, pitiful stages. He was digging with his huge, raw-boned hands into the snow blanket, seeking frozen roots to grasp and tug on.

MacHeth sprang swiftly over the rail and landed squarely on the snow, his heavy boots sending splinters of ice into the air. He fell to his knees beside the stricken man.

"Jim," he muttered. "Good Lord, Jimmy my lad, I thought you were ninety miles away. What happened, lad? What happened to you out there."

James Powell was incapable of speech. He tried to rise on his elbows, but fell back choking. His eyes were glazed and staring. No recognition in his eyes at all. MacHeth shuddered. Compassion shone in his gaze. He put his arm about Powell's shoulders, lifted him up.

The younger man groaned. A faint glint of awareness came into his pupils; then his face went blank again. His entire body sagged. But MacHeth knew what to do for a man half-frozen. Knew what to do for a poor, stricken lad with snow-maggots crawling through his brain.

Together they stumbled toward the shack, up the sloping porch where the radio was saying: "Europe is frantic. All the stations in Europe and North Africa are bombarding us with questions. They have not seen the barrier, but they have picked up our reports. Trans-oceanic planes have gone out from London, Paris and Leningrad. The old world will soon share our—"

Into the cabin they went unheeding. MacHeth's only concern now was to restore his young friend, pour warming drinks into him, get the stiff, frozen furs off and a bright, crackling fire close to his frost-numbed limbs.

Out on the porch the radio announced: "The barrier has encircled the world. Half Siberia, China are gone. The Indian Ocean—"

Warmth returned to Powell's body in painful, slow stages. MacHeth brought him safely past the danger line. MacHeth had stripped him to the buff and massaged him with snow until his eyes had ceased to stare filmily. Then—the fire, thick logs in a big, smelly stove, hot towels encircling him from ankle to throat, brandy in a glass that reflected the flickering radiance of a smoky oil lamp.

Powell watched little shifting lights dancing on the glass as MacHeth held it toward him. He stretched out hands that shook, cradled the glass in his palms, held it to his lips and drained it gratefully. He smiled

wanly. Warmth returned, creeping up his limbs.

Out on the porch the radio said: "Martial law has been declared in Maine and Vermont. The Governor of Maine and the Governor of Vermont are in conference at Portland. This is the New England Broadcasting Company, Station TVH, broadcasting on a 660 kilocycle wave length from Augusta, Maine."

JAMES POWELL was talking now. Words poured from his lips in a continuous stream. He was clutching the arms of his chair and talking, talking. His face, lighted fitfully by the smoky lamp, was pale and tormented.

"I tell you, MacHeth, it isn't just a local phenomenon. I followed it south for miles. God only knows how far that ghastly wall extends."

The older man said: "I know how far it extends, Jim my lad, but I'd rather take a flogging than tell you."

He was slowly pacing the floor, his big head lowered, his thumbs in his belt. His face was compassionate, grief-shadowed.

"Sure, I know what you're thinking, lad. I know why you've dragged yourself here through the snow and ice, hoping, p r a y i n g, that the cold wouldn't kill you. You're thinking we can go back there with dynamite sticks and blast through to her."

He compressed his lips. "I haven't seen the barrier, Jim, but reports have been coming in over the radio. It extends far beyond the barren country."

Powell began to tremble.

"You mean, others have seen it?"

MacHeth nodded. "Thousands have seen it, lad. It encircles the globe from pole to pole. It's swallowed up America and the Pacific Ocean. A wave of hysteria is sweeping the world."

"It's swallowed up America! Then how—"

"Only a little strip remains, Jim. The northeastern coast of North America and Haiti and Porto Rico. We're completely cut off from the rest of the continent. The scientists on our little strip have been broadcasting at intervals, but no one knows what the barrier is composed of.

"They've sent armored tanks against it, bombarded it with projectiles. It's more resistent than plated steel. It has hurled back energies potent enough to alter atomic structure. Apparently it's a sort of force field, but it's immune to high-voltage bombardment and cannot be electro-magnetic in nature."

His face twitched. "You're not alone in your grief, lad. I've lost my little girl in Winnipeg. It's conceivable she's alive and safe—merely cut off from us by a thin wall. But the barrier may be hundreds of miles in extent, a vast, all-engulfing mass stretching from coast to coast and swallowing up all the land between."

For an instant Powell sat as though stunned. His face was the color of clay; his eyes deep pools of agony. The older man had resumed his pacing. Back and forth, back and forth before the roaring stove, his shoulders bent and shapeless.

Slowly, unsteadily, Powell rose to his feet. "I know that Louise is alive, MacHeth," he said. "I haven't lost her. Oh, dear God, help me, give me strength."

Out on the porch the radio announced: "—widespread social disorganization. The disappearance of the United States threatens the economic stability of Europe."

CHAPTER III

Into the Stratosphere

THE Premier of France moved wearily over the arid New England soil, his face set in grim lines. Pierre Cambon was a young man of thirty-six. He looked twenty-five. Slim and boyish in build, he walked now without the resilience of youth, his thin-featured face turned toward the rising sun, his checkered mackintosh sloshing about his knees.

Before him stretched the level expanse of open countryside, black domed hills rising in the distance, a blue haze upon the world at dawn. Before him hundreds of tiny black fig-

ures were moving excitedly in a circle about a vast and intricate network of dangling ropes and cables.

The stratosphere balloon swayed a little in the faint breeze which was blowing down from the hills beyond. Towering for five hundred feet into the sky, its great, flabby body shone like frosted silver in the pale light of dawning.

About its spherical gondola the little, surging figures in black presently resolved themselves into the British Secretary for Foreign Affairs, the Italian Minister of Colonies, the King of the Belgians, the Premier of Poland, two admirals of the British Navy, a commander of the Italian Air Force, the Russian Commissar for Foreign Affairs, the Premier of the Netherlands, the Crown Prince of Sweden, the Governors of Maine, New Hampshire and Vermont, newspaper men and women from all the capitals of Europe, writers, artists, photographers, military and civil representatives of the South American republics.

The Premier of France was a modest and unassuming young man. He did not take up his position with the dignitaries at the base of the gondola, but stood with lesser spectators in a roped-off quadrangle a hundred feet away, shading his eyes with his hand as he gazed up at the Gargantuan balloon.

On all sides of him other young men stood on tiptoe, camera cases strapped to their straining backs or pencils poised above opened notebooks. Reporters, photographers, young lads with no responsibilities that weighed upon them and robbed them of zest.

He tried to return across the years to his cast-off youth, to forget that he was responsible for the welfare and happiness of forty-two million human beings. He tried desperately to be one of those careless young men again. He rubbed shoulders with them, talked to them.

He told himself that even if half the world was lost, and all of Europe in travail, here was a moment worth living for. The spirit of man was about to soar again, perhaps on its last heroic journey.

High above the State of Maine, the Corvus—that was the balloon's name—would look down on a sundered world and its pilots would not be victimized by false hopes or vain illusions. Thirty miles above the surface of Earth, they would look down.

Beneath a jet black sky, in the wan light of the Sun's corona, beneath stars coldly glittering, in a swirl of deadly gases, they would look down. *And the world would know the truth at last.* It would know the truth of this thing which had swallowed up half the world, which had separated kith from kin, which had separated the meteorologist, James Powell, from his wife, Louise.

THE young man on Cambon's right was tremendously excited. He was a thin, pale young man with mouse-colored hair and the lonely look of genius. He had an open notebook in his hand and he was talking, talking.

"All they'll see is a white cloud blanket," he said. "A white cloud blanket spreading over the land."

Pierre Cambon turned and stared at him, a wry smile on his lips. "You're pretty skeptical about it, aren't you?" he said.

"Yes," replied the young man. "They won't see a thing. But the flight itself is—is tremendous. They're going to ascend twice as high as Captain Stevens, and the three Russians who dropped to their death from 72,000 feet in 1934. Can you imagine what it will be like up there!"

"I think I can," said the Premier of France cautiously. "It will be fairly warm, for one thing. The air will be as brilliant as the heart of a diamond, unobscured by dust particles or water vapor. They'll see the sun, the constellations and the northern lights simultaneously in different parts of the sky. Ultra-violet rays of the deadly 'black sheep' variety will burn their eyes out. And they'll perhaps explode, like those fish Mr. Beebe brought up from a quarter mile."

"You're forgetting the gondola and their protective suits," said the young man.

"Of course," said Cambon. "I'm speaking theoretically, suspending

them naked in the sky. But if the balloon rips and they have to use their parachutes the descent will not be pleasant."

Cambon's companion nodded grimly.

"The three Russians were disfigured beyond recognition," he said.

There was a curious, rippling interplay of light and shade on the cyclopean, helium-filled balloon, and the crowd close to it began to murmur excitedly.

"They're getting ready to take off," the young man said. "The first hundred feet will tell the story. One of Auguste Piccard's balloons burned up in Brussels before he could get it into the air. And his brother's big double-decker exploded in Iowa a short distance from the ground."

There was a sudden shout from the crowd. Whistles blew, a siren sounded and a woman screamed hysterically.

Cambon smiled, lapsed into American slang. "That girl can't take it," he said.

The big balloon began to rise. Slowly, steadily, it soared above the wildly pressing, shouting, gesticulating circle of frenzied onlookers, slipping its moorings so smoothly and unobtrusively that it was outlined against the hills in ascending splendor before Cambon could accustom his gaze to the blinding glare of sun-drenched rubber and silk.

The young man beside him was scribbling feverishly. On his left another young man was confiding to a girl with blond, bobbed hair and intense, too-earnest eyes the secret of the ascending balloon's lifting power.

"It's the largest bag ever constructed," he was saying. It has an area of nearly four acres and when it's fully inflated it will hold five million cubic feet of helium gas. The gas will be heated by electric batteries inside the gondola."

THE *Corvus* was rising swiftly now. Its immense gondola caught and reflected the sunlight in luminous bands. Behind the silver bag the morning sky was flecked with fleecy wisps of clouds stained yellow, blue and red by the shimmering radiance of the solar disc. The hills far below were a glory of pale saffron. From their domed summits a thin white mist was ascending in spirals toward the rapidly mounting gondola.

The young man on Cambon's right said: "The dawn never came up like that before. It isn't a New England dawn at all."

Cambon did not reply. He was gazing intently skyward, shading his eyes with his hand. All about him other absorbed spectators, silent for the most part, were watching the great balloon ascend into the clouds. The spectacle was breathtaking in its loveliness.

For several hundred feet the balloon ascended steadily, unwaveringly, with the mechanical precision of a helicopter. Then, suddenly, it veered a little, responding to converging winds in the wake of the scurrying clouds. It swayed to and fro and spun about like a top.

For fifteen minutes Cambon stood without movement, pressed close to the ropes of the press quadrangle, unmindful of the strain on his pupils.

A mile above the earth the great ship veered again, dipping in a slow curve and then passing slowly westward until it was lost to view in the scoured and glistening bowl of the sky.

Cambon's companion snapped his notebook shut.

"Boy, I never thought they'd make it. Getting a bag that size into the air is no tyro's job. Did you notice how smoothly they rose?"

Cambon nodded. In American slang he affirmed, a trifle ineptly. "It sure was a sweet takeoff."

The young man looked at him, smiled. "You're a Frenchman, aren't you?"

The Premier of France nodded.

The young man extended his hand. "Name's Greason," he said. "I'm a special correspondent for the Bangor *Post-Dispatch*. We've a long wait ahead of us, so we may as well be sociable."

Cambon said: "A good idea. You can call me Pierre. They tell me they've put in a lunch counter in the

barracks where we're supposed to wait. How about stacking up on some eggs and coffee."

"Swell," said Greason. "Let's beat these babies to it if we can."

The barracks consisted of two immense, bleakly forbidding buildings on the rim of the flying field, eighty feet from the roped-in quadrangle. A break in the reportorial ranks had already occurred, men and girls hurrying over the barren ground toward food, warmth and shelter.

The lunch counter completely encircled the spacious assembly hall of the Maine National Guard, Third Regiment Armory, which had been temporarily converted into a waiting room for representatives of the press. The revolving enameled chairs were already filling when Greason and the Premier of France seated themselves before an electric waffle stove and a pretty blonde waitress with a rose in her hair.

They ordered fried eggs with bacon and black coffee.

"It's funny about that Canadian joining the party, isn't it?" Greason said. "What was his name—Powers, Powys—"

"POWELL," said Cambon. "Apparently a very intense young man. He pleaded with them to take him along. He said he had nothing to live for."

"I seem to remember reading about it in the *Dispatch*," said Greason. "He was out in the north country when the barrier arose. He was living in a pinewood shack right in the path of the barrier. He was within thirty or forty feet of the cabin and his wife was running out to greet him when the barrier arose, and swallowed her up."

"Poor lad," said the Premier of France.

"Yeah, it was tough. I don't wonder he went half crazy."

Warmed by the coffee, and solaced by after-breakfast pipes, they withdrew from the counter and sank into wicker easy chairs in the center of the assembly hall. Time did not drag as they sat there talking. The morning passed so quickly that they were surprised and a little incredulous when the pretty waitress changed the menu above the lunch counter and the vacant stools began to fill again.

The two men pushed their chairs back and started across the assembly hall. They were halfway to the door when the wail of sirens brought them up short.

Greason turned to his companion.

"News," he said. "They've either landed safely or—"

He let the sentence trail off, his face suddenly grim. There was a scraping of chairs behind them, an excited murmur as the siren wails grew in volume. The newspapermen and women raced for the door. Greason and Cambon sprinted to avoid being bowled over.

The press quadrangle was soon crowded to capacity. The loud speaker which had been set up boomed, and a hush fell over the gathering.

"Attention everyone. Attention everyone. The *Corvus* has alighted in Nova Scotia, eight miles north of Halifax. Captain Daly and Lieutenant Williamson ascended twenty-nine miles and drifted westward *above* the barrier."

A long-drawn murmur rose from the crowd. The loud speaker resumed: "Daly and Williamson have just arrived in Halifax. Although neither pilot has sustained serious injuries, Williamson is in a state of exhaustion bordering on collapse."

There was a brief pause for station identification. "This broadcast is coming to you from Government Station HY3, Cape Sable, Nova Scotia."

But the question everyone was asking was: "The mystery of the barrier —have they fathomed it at last?"

As though in reply to this question the loud speaker said:

"Captain Daly reports discoveries of a most startling nature. As the recording instruments have not as yet been checked over, allowances must be made for minor inaccuracies in the transcriptions which we have been authorized to read to you."

Another voice took over: "Government Station HY3, Cape Sable, Nova Scotia. Attention everyone. Reading from Captain Daly's notes. Reading from Daly's notes."

CHAPTER IV

Wonder Incredible

IT was an experience never to be forgotten. Captain Daly's notes read as follows:

6 A.M.—We are getting ready to take off. We are prepared for every imaginable contingency. We have checked all instruments; and the parachutes are in perfect order. Williamson is at the controls; James Powell is pacing the gondola. I am extremely nervous myself; jittery.

6:15 A.M.—We are off! The gondola is five hundred feet from the ground and rising rapidly. We had no difficulty at all in ascending. We did not drift over the ground before the gas started expanding. Our electrical heating mechanisms are miracles of efficiency. We rose straight up, and are still rising.

6:30 A.M.—We are rising nine hundred feet a minute. There are no clouds directly beneath us and the air outside is clear, the visibility splendid. We are now sixteen thousand feet above sea level and beginning to to drift westward. Just before we reached this level we passed through a miniature whirlwind in the lower atmosphere. The converging currents spun us about until the air-chimneys rattled.

6:45 A.M.—30,000 feet above sea level and drifting rapidly in a westerly direction. Most of the land beneath us is obscured by cirrus clouds. The sky is turning from marine to dark blue. No violet tinge yet visible. We are approaching the lower limit of the Tropopause. Berson ascended to about this height in 1901. Berson, stratosphere pioneer, we salute you across the twin gulfs of time and space.

7 A.M.—43,000 feet. We have passed the lower boundary of the stratosphere. The sky is dark purple; all clouds have vanished. Our westward drift still continues.

7:15 A.M.—We are now ten miles above the surface of the earth. Piccard, Zille and Cosyns, we salute you. We have rivaled your marks; we are soaring higher. We cannot be far from the barrier. The sky is now dark mauve-violet deepening into gray. Beneath us the land is beginning to curl up on its outer edges like the rind of a sun-dried fruit. Horizons are almost imperceptibly rising toward us; the earth directly below sinking into a hollow flecked with red splotches like spilled blood. A curious optical illusion.

We can see the sun's corona now. The sun is a dull red ball in the eastern sky. The stars are obscurely visible; faint ghost-specks in the firmament.

7:30 A.M.—Twelve miles above Earth. The temperature is rising slowly. Outside the cabin it is forty degrees centigrade below freezing. The dial thermometer inside the cabin registers seven degrees. We have confirmed Captain Steven's observations regarding cosmic rays. At this altitude we are experiencing a terrific bombardment of both cosmic and ultra-violet radiation. The cosmic rays are fifty to seventy times stronger than on Earth. Heaven knows what would happen to us if we were suspended unclothed outside the gondola. Perhaps we should shrivel to cinders.

8 A.M.—We are tremendously excited, exhilarated inside our suits. We feel buoyant, light-headed. I cannot account for it. The oxygen supply is stable and constant.

PERHAPS the radiations are affecting us. Or perhaps we are close to the barrier and responding to its mysterious emanations. According to Williamson's calculations, we are only a few miles from the barrier. But we cannot see it. All the west is veiled in a peculiar, mistlike haze. Meteor-dust, perhaps.

8:15 A.M.—Of course we do not know that the barrier extends as high as this. The sounding balloon which the Maine government sent up last week seemingly contacted it at fourteen miles, but we must allow for a wide margin of error. Cosmic rays may have affected the recording instruments. So far we have not

glimpsed the barrier.

We are now 72,500 feet. Stevens, we salute you. We have surpassed your glorious achievement and soar into the unknown. The sky is now definitely black. The sun is a halo-encircled disc of red flame smoldering in an ebon immensity and all the stars of heaven are beckoning us on. Immense and far-flung constellations, island universes without number, receding to the rim of space.

I could wish for a less Earthbound vehicle. The great bag above us is paltry beneath the stars. I could wish for a smooth, cylindrical shape with an explosion chamber at its base. Then there would be no limits to our penetration of the unknown.

9 A.M.—We have sighted the barrier! The thin haze to the west has dissolved completely and the barrier is distinctly visible in the distance. We are drifting straight toward it. A smooth, white, glistening wall, it towers above us, cutting off the sky to the west and obscurely reflecting the glimmering constellations. We cannot see above it.

9:30 A.M.—We are now within three or four miles of the barrier and twenty-three miles above Earth's surface. Man has never before ascended so far into the sky. The temperature is still rising. It is now only a few degrees below freezing. We have tested the air through the atmosphere chimneys and have discovered that it contains decidedly poisonous ingredients. Methane gas in sufficient quantities to kill a legion of rats. I wish we had taken up some Drosophila flies for testing purposes. At this level the cosmic radiation is terrific. I'm convinced it would alter chromosomes beyond recognition; produce fruit-fly monsters of utterly fantastic pattern.

10 A.M.—We have reached the summit of the barrier. We can see above it. It does not extend indefinitely into the sky. We are now twenty-six miles above Earth and within less than a mile of the great wall, drifting straight toward it, but slowly.

10:15 A.M.—We are passing above the barrier. We are passing completely over it. We have attained an altitude of twenty-eight miles and have ceased to ascend. Beneath us there is a glistening white opacity extending in all directions. The Earth below is completely invisible. We are drifting slowly westward above the barrier.

10:30 A.M.—We have made a terrifying discovery. No words can do justice to a mystery so unfathomable, so appalling. I scarcely know how to record what we have seen. My companions are too stunned and confused to speculate about it at all. They are waiting for me to break the strange reticence that has risen between us. They are almost pathetically confused and terrified. I am writing swiftly in silence. I seem to be remote from my body. My hand is trembling unaccountably.

HALF the world has vanished! The Earth beneath us has disappeared. Directly beneath us stars are shining in the black depths of the sky. Beyond the barrier there is —*nothing*.

It is difficult to adjust oneself to a thought so staggering. *The barrier has cut the world in two!* All that remains is a half-globe spinning through the sky. Incredible, unthinkable—

We are drifting over the vanished hemisphere as though Earth were still a sphere. The vast, glowing space gulf beneath us is exerting a balanced gravitational pull.

Where has the missing half gone? The Earth should be in fragments, should be receding toward the outer planets or rushing in erratic orbits about the sun. If there is no turning mass beneath us, why were we not sucked into a vortex by the Earth's receding bulk?

In utter definance of every physical law, the Earth is still revolving on its axis and following its age-old course about the Sun. A half-globe revolving in the sky, maintaining the equilibrium of a sphere. The mind shrinks back appalled before a mystery so terrifying.

11 A.M.—A ghastly tragedy has occurred. James Powell has leaped to his death. I was writing rapidly when he arose from beside the massive, lead-ensheathed ionization chamber opposite the sky-escape port and crossed

to where I was standing. He seized my pad and pencil and scrawled a few lines hastily. Then he handed the pad back and pulled me about until I was facing him. He stared at me steadily, feverishly for a moment. His lips moved. Behind the quartz window of his helmet his face was tormented, convulsed.

Poor, poor devil. He was trying to say good-bye. The terrible, burning intensity of his gaze should have warned me. But it all happened so swiftly I was caught off guard.

He leapt boldly into space. Beyond the open port we saw his encumbered body plummet downward into the abyss.

His parachute unfolded thousands of feet beneath us. We watched it blossom and dwindle until it became a tiny white speck receding into the vast, black bowl of the sky.

When I closed the sky-escape port I was shaking like a leaf. Williamson had to steady me. I sat down and read Powell's hastily scrawled, last message.

It said: "Good-bye, Harry, Fred. All my world is gone. All my life has disappeared like the stars at dawn. I have lost the woman I love, and the world which awaits your return is not my home at all. Perhaps I shall meet her again in some eternal world, beyond, space, beyond time. I am going to meet Death now. He will unlock all gates. If there is a key, he will place it in my hands. If there is no key, no gate even—well, I am grateful for what life gave. I stood once in the sunlight and spoke her name."

11:15 A.M.—We have reversed our course and are drifting back across the barrier. We are returning to the half-Earth spurned by poor Powell. The mystery, the horror seem remote now, like emotions experienced in another life, long ago. We have passed beyond feeling. I write mechanically, desiring simply to complete this record. In a moment we shall be descending through familiar skies. A sea of mist is rising like a tide to the east of us.

* * * * *

THE loud speaker fell suddenly silent. From the vast assemblage on the flying field there arose murmurs of wonder, incredulity, horror and awe. Men and women formed suddenly into little agitated groups, like crystals volatilizing in a test-tube. Little groups that gesticulated and jumped erratically about, forming grotesque patterns far out on the field.

Greason and Cambon remained isolated. From the long range of distant hills a mist was creeping down into the valley, swirling over the level expanse before them on the edge of the press quadrangle.

"My people," Cambon murmured. "My people—where are they . . ."

Greason glanced up at the smoky disc of the sun, high in the noonday cloudsky. "Our little race will carry on," he muttered.

Cambon was envisaging fifty million Frenchmen revolving on a half-globe in the wide wastes of the firmament.

He said: "There is no courage like the courage of my countrymen. Long live France!"

CHAPTER V

Strange Awakening

JAMES POWELL'S parachute billowed cloudlike against the black, star-studded sky. The man beneath turned slowly, his stratosphere suit bathed in the wild, free light of the abyss; his gleaming helmet shimmering with micro-rays from Orion, the great warrior constellation.

Far above him and rapidly receding was the Gargantuan balloon which had carried him beyond the world. All about him stretched the boundaries of night and a vastness that surged rampant, a star-glow stupendous. Only one little portion of the sky was opaque, as though some cosmic giant had shut a door in the outer corridors of space.

The Earth perhaps. The half-Earth, blocking out a few of the stars; the half-Earth, spinning to its doom. To James Powell, suspended in space above a world that had vanished it did not greatly matter.

He cursed man's inventiveness. A

parachute that opened automatically was no boon to a man bent on death. To float slowly through space when all the senses cried out for annihilation, for an end to despair and grief, was torment.

Powell's face was haggard and twitching inside the helmet of his protective suit. He wanted only one fulfillment now; to become one with the Universe; a part of its mysterious chemistry, a part of its inner life. One with Auriga and the Pleiades, one with Cassiopeia, Cetus, Gemini, one with the fire mists and the spiral nebulae.

And dreaming thus, hoping thus, tormented, in agony, a flyspeck of living matter suspended helplessly in the black night of space, he passed from consciousness and dreaming into a merciful oblivion that blotted out the stars. . . .

* * * * *

LIGHT caressed James Powell's eyelids gently, causing him no pain, bringing solace to his awakening mind, dispelling the terrible, deep darkness. Light that glowed and burned through the thin skin of his eyelids until they flickered back and he saw the clear blue of the sky and the radiant stranger bending above him.

"Hello," she said. "Jam Powan, hello."

Dazed, incredulous, he raised himself on his elbow and stared about him.

Standing in a circle about him were seven men and five women. Tall, lithelimbed, wondrously radiant, they stood silently watching him, their flowing, tuniclike garments shimmering opalescently in the warm, bright sunlight.

"You have returned to Earth, Jam Powan," said the girl at his side. "after twenty thousand years."

Powell stared at her mutely, his mind unable to adjust itself to sunlight after darkness, the wonder and strangeness of the firm earth under him, and a woman by his side.

"Jam Powan, we knew you would return," she said. "The legends did not lie. Thousands of years ago you passed into the lost hemisphere. You passed into it deliberately, fearlessly, because love is stronger than death."

A tall, fair-haired youth detached himself from the watching circle, fell to his kness beside the girl.

"I will talk to him," he said. "Let me talk to him, Melcha."

"Yes, Sanjii." The girl nodded and began to stroke Powell's forehead gently with her palm.

The young man said: "Melcha and I speak the old Earth language, English. For many years we have studied the old language, mastering even its idiom. We are—yes, research scholars."

Melcha smiled. "Sanjii is pedantic," she said. "He does not know the full, singing sweetness of the old language. But his idiom is more exact than mine."

"Yes," corroborated Sanjii. "And there is so much that needs explaining. You will live now in a strange, new world. Your mind will have to adjust itself—oh, with such terrible swiftness. The shock will be like a birth-pang. So with clear, strong words I will ease the pain a little."

He paused an instant, nodding, regarding Powell compassionately. Then he said:

"Twenty thousand years ago half the world passed into a little traveling involucre or kink in the outer rind of our eight-dimensional space.

"The scientists of your age did not know that space was eight-dimensional. Your astrophysicists, Einstein, Eddington, De Sitter, envisaged the Universe as a great, bubblelike system constantly expanding and doomed to eventual extinction. They did not know that the Universe was neither expanding nor contracting, but simply renewing itself in multi-dimensional layers.

"Something like a snake shedding its skin, writhing out from the crinkled, aging envelop, and leaving a cast off slough to disintegrate into heat-death. For millions of years our Universe has been shedding its skin. Stupendously across space in convulsive patterns. The scientists of your age were bewildered by this crinkling of space. Your Einstein, in a moment of intuitive genius, glimpsed a little of the truth.

"BUT even your Einstein did not know that space is constantly renewing itself. The multi-dimensional conflux of space-time continuums which the science of our age has accepted as a true picture of reality would be incomprehensible to a man of the twentieth century.

"Even your Einstein did not know that in certain regions of the vast, outer space-rind which is the universe of stars the skin is sloughing convulsively, folding space in upon itself, concealing in limbo the outermost galaxies. The dark nebula which the mariners of your age called the 'Coal Sack' is such a region—the tear or break is complete there.

"Have you ever watched a snake shed its skin? The integument sloughs unevenly. Little ripples run along the entire snake; little surface tremblings on the still intact skin. Half of Earth was caught up in a little, premonitory shiver far from the region of convulsive sloughing. A tiny, tremulous surface-kink which went back on the 'snake' again.

"We knew that it would go back. The scientists of our age do not grope feebly in darkness or think in terms of empty abstractions. To us the Universe is an open book and we have added to our powers until we can read without stammering. Lately we have known that the kink would smooth out again. We have known that our age would see the re-emergence of the lost hemisphere.

"For twenty thousand years half of Earth has existed in a kind of spatial vacuum. For twenty thousand years millions of Earth's inhabitants have existed in a static void, ceasing to age, ceasing to change at all. Like beetles in amber or bodies frozen in a glacier. All change, all movement, all animal consciousness were arrested on the vanished half-globe."

Sanjii stopped and the girl took up the story. "The half-globe has just emerged from the spatial kink, Jam Powan. All over Earth the men and women of our world are helping the confused, bewildered, terrified inhabitants of the lost hemisphere to adjust themselves to the change."

Sanjii frowned slightly.

"Please do not interrupt, Melcha," he said. "Twenty thousand years ago a barrier arose between the hemispheres. Half the world vanished into the kink, leaving a thin region of super-gravitation where the fundamental particles of matter, protons, were in turbulent flux. That region was the barrier of your age, the barrier which you crossed high in the sky. The barrier was the point of suture; the dividing line between the world that remained, and the vanished hemisphere.

"The world that remained maintained its integrity as a sphere and continued on its accustomed orbit about the Sun. It is difficult to explain to a man of the twentieth century how that was possible. The actual properties of eight-dimensional space would be incomprehensible to you.

"SUPPOSE I put it this way. When space crinkles, the matter which it contains maintains its integrity in certain directions, continues to exist as a ghostly shell of force within a zone of four-dimensional curvature—the old Einsteinian curvature. The vanished hemisphere did not shed its mass entirely. It remained a 'ghost hemisphere' balancing the half-globe that survived outside the kink, maintaining Earth's integrity as a sphere. Of course my explanation is inexact, but when you have mastered the science of our age you will comprehend it clearly."

He paused once more. James Powell's brow was wet. The circle of radiant men and women drew closer about him and watched him with compassionate, benevolent interest.

The girl said: "Sanjii speaks stiffly. Oh, how I long to greet you as a woman would who loves. I love you, Jam Powan. All the women of our world love you."

Sanjii smiled. "You have become a symbol of Earth's heroic youth," he said. "We have awaited your return with eagerness."

Powell spoke. His tongue seemed thick and unwieldy; he pronounced words with difficulty.

"Is what you're trying to tell me,"

he said slowly, "that I passed above that barrier *twenty thousand years ago?*"

Sanjii nodded. "Yes. High above Earth you leaped fearlessly into space from the stratosphere balloon *Corvus*. You thought you were leaping to your death. All about you stretched illimitable space. You did not know that you were descending into the vanished hemisphere. Above the barrier the space-kink was unprotected by the fiercely raging proton screen. It sucked you in."

The girl said: "You lost memory and desire for twenty thousand years."

"You ceased to age or change thirty miles above the surface of the vanished Half-Earth," elaborated Sanjii. "As soon as you passed into the kink you ceased to dream or remember. Time stood still."

Melcha said: "Your companions in that valiant flight returned across the barrier and descended to Earth above the triangular sealand which was then called Nova Scotia. Even now their names, Dalan, Wallansun, have a curious horror for us."

Sanjii's scowl deepened. "Be quiet, Melcha. You are not doing Jam Powan too much good with that kind of talk. When your companions returned, Jam Powan they were exhausted and terrified. They brought back a message of despair to a despairing world, and that is why their names chill and depress us. When we are fearful or dismayed we say: 'Dalan-wallan.' But your name—your name, Jam Powan, is a synonym for dauntless courage and a love that was stronger than death."

"We know *why* you leaped boldly into space, Jam Powan," said Melcha. "Your name has become a legend and a glory. Down across the ages all women in love have adored you."

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A Complete Short Novel of the Future by the Late

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"WE were confident you would return," said Melcha. "We knew that you were suspended in the kink, high in the sky above the old land of New Yorak. When the kink began to smooth out, we drew near to this point. I and my companions welcome you, Jam Powan, man of the twentieth century. We welcome you and all your people, all the poor, bewildered, pitiful lost ones who have returned to life and the process of growing old.

Melcha suddenly flung her arms about Powell's shoulders, laid her head upon his breast and murmured. "I love you, Jam Powan."

Light from the great sun tinted her fair skin, her milk-white shoulders. Her long, unbound hair was the color of honey. Sanjii scowled, grasped her arm and drew her from the bewildered man on the ground.

"Melcha, you must not. In the twentieth century men and women were not so candid and fearless."

Powell brushed his eyes with the back of his hand. He was still confused and a little terrified. He said tremulously: "I think I understand. You are in love with love."

Melcha nodded delightedly. "To all women all men are lovely," she said. "And to all men, all women. We do not think it shameful to be in love with love."

A faint, half-bewildered smile hovered for an instant on Powell's white lips. "But—it is difficult to explain—there is no room for another in my heart."

"We know that, Jam Powan," said Melcha. "We have brought her to you. Look!"

She stood up, raised her arm and pointed. The men and women about Powell had stepped to one side, leaving his vision unimpeded. Before him stretched a level expanse of open countryside. Less than a hundred feet away and a little to the left of where he was reclining, an immense, silvery cone was slowly revolving in the sunlight.

Melcha said: "Look, Jam Powan. That is the ionosphere rocket, Draco. Fifteen minutes ago it ascended into the ionosphere from the old land of Newfoundland."

Even as she spoke a crescent of blackness bisected the tapering summit of the cone. Slowly it wavered and widened, dividing the periphery of the rocket into two glowing segments. From nebulously weaving darkness three forms emerged. They seemed to float through the air as they descended to the base of the still revolving cone. Powell began suddenly to tremble. He rose to his knees, his heart leaping wildly, his eyes widening in incredulous wonder.

Two tall and radiant figures were advancing toward him over the level ground. Lithe-limbed, fair of countenance, their flowing tunics caressed by the light breeze, they moved with the buoyancy and grace of gods unaging in the morning of the world.

BETWEEN them walked a slender young girl. She was wearing a coonskin coat and high leather boots and her copper-colored hair was blowing in the wind.

Powell got unsteadily to his feet. Gone now was his bewilderment and despair; all the confusion of his strange awakening. In a single heartbeat of time he was restored, made whole again.

The advancing girl paused suddenly. She trembled and cried out—and cried out again, her voice inarticulate with wonder. For a long, startled moment she stood staring at him, her eyes shining, her breath coming fast. Then she swayed a little and spoke his name, raising her arms eagerly toward him.

This time no barrier came between them.

Quicker than thought he was at her side. He caught her to him and kissed her hair and lips and eyes, unmindful of any audience.

"My darling Louise," he murmured, cradling her face with his palms, straining her to him until he could feel the beating of her heart. Sobbing, murmuring endearments, she clung to him, drawing him repeatedly to the sweetness of her lips until the sunlight seemed to brighten about them and the fire of their love soared and blazed like flames in a parched wilderness.

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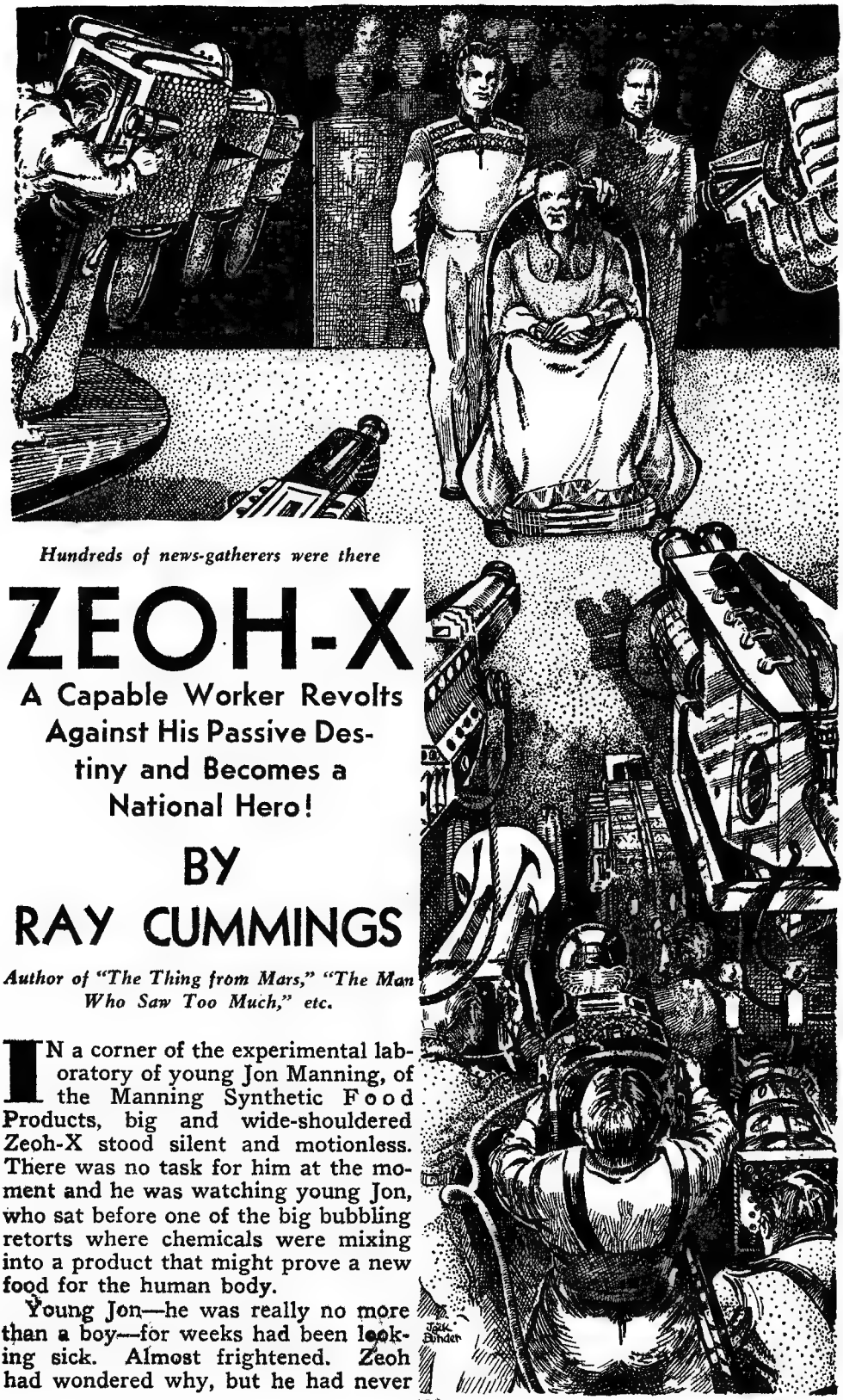

Hundreds of news-gatherers were there

ZEOH-X

A Capable Worker Revolts Against His Passive Destiny and Becomes a National Hero!

BY RAY CUMMINGS

Author of "The Thing from Mars," "The Man Who Saw Too Much," etc.

IN a corner of the experimental laboratory of young Jon Manning, of the Manning Synthetic Food Products, big and wide-shouldered Zeoh-X stood silent and motionless. There was no task for him at the moment and he was watching young Jon, who sat before one of the big bubbling retorts where chemicals were mixing into a product that might prove a new food for the human body.

Young Jon—he was really no more than a boy—for weeks had been looking sick. Almost frightened. Zeoh had wondered why, but he had never

quite dared to ask. Questions were not natural to workers such as he. But tonight, in the purple glare of the heat-torches which were under the retorts with the purple-glowing fluorescent tubes beside them, young Jon's handsome face seemed more haggard than ever.

"What is the matter with you?" Zeoh asked suddenly. "Something is wrong, Master?"

He had not meant to ask the question. His guttural but resonant voice had an abnormal quaver to it. Young Jon looked up, startled.

"Eh? Oh, you, Zeoh? What did you say?"

"You look wrong," Zeoh responded. "What is the trouble?"

With a measured step he came forward and stood over young Jon. He was a big fellow, this Zeoh-X. He knew nothing except work. He had come here to serve young Jon Manning in the summer of 2240, a year ago.

Formerly he had been in the great factories of Windsor-Detroit. Old Georg Manning, Jon's father, had established those factories. He had trained Zeoh-X in them. And out of them—helped by Zeoh-X and a thousand workers like him, and ten thousand others less skilled—old Manning had made himself one of the richest men in the world.

"What is the trouble, Master?" Zeoh repeated.

It was the first time Zeoh had originated any questions beyond those necessary to the understanding of his simple tasks. It startled young Jon. For a moment he stared blankly. And then he gasped.

"Why—why, Zeoh—you're questioning me?"

Abruptly in the silence, the audiphone buzzed.

"Shall I respond to it, Mr. Jon?" Zeoh offered.

"No. I will."

Zeoh stood motionless in the corner across the room. But the split-wave, incoming aerial voice was as clear to his acute hearing as though the speaker were here in person. It was a call from the Honorable Robert Blakinson, world Secretary of the Interplanetary Federation, in Great-London.

Silently Zeoh stood watching and listening. Never before in his life had he made any real contact with his master's affairs. He had no way of understanding them; he never thought about them at all. He was a simple worker. But very queerly, somehow now he wanted to understand this thing which was transpiring before him. It was something that seemed hurting young Jon Manning.

Zeoh did not like that. Jon, even though he was only a boy of nineteen, was a good master. His orders were always clear and crisp; Zeoh had no trouble in handling them. And dimly within Zeoh now was a desire to help—a confusing desire to do something of his own free-will that would help young Jon. Something not just the routine work for which he had been trained.

ZEOH could not understand very clearly the audiphone conversation. But all of it was etched on his trained memory with complete clearness. There was, it seemed, a revolution impending on distant Mars. The Ferrok-Shahn Government of Mars, allied to the World-Federation, was complaining that the embargo-neutrality treaty was being violated by Earth. It seemed that Tormai—a giant, seven-foot Martian revolutionary leader—was secretly here on Earth, buying electronic munitions and they were being smuggled from Earth to Mars by a bandit Space-flyer.

"Where Tormai is getting the money to buy—here on Earth—these illicit armaments, God only knows," the Great-London Secretary was saying.

"Why do you call me?" young Jon Manning asked in perplexity.

Blakinson hesitated. "Shall I be blunt, Manning?"

"Yes, of course."

"The bandit flyer must be found and caught," the Secretary said grimly. "Our under-cover Shadow Squad of World Police cannot locate it. We believe it is here now, being loaded with munitions for this Interplanetary smuggling. Tormai must be caught. If this goes on—"

The World Secretary's voice went even more grim than before. "If we don't stop it, the Martian Government will formally declare that we've violated our treaty. We'll have the whole Interplanetary League after us. It could mean war—"

"Yes, sir. But still—why do you call me?" young Jon murmured.

Zeoh could hear a quivering timbre of terror now in his voice.

"Tormai, to do this, needs very considerable funds," the Secretary said. "Our Shadow Squad has reason to believe that he is getting the financial backing here on Earth. And your father, Georg J. Manning—"

"My father?" Jon quavered.

"Your father is a man of vast wealth. We know he is ill at present in the Pathological Institute of Dr. Argon, out there near you. That's true, isn't it?"

"Yes," Jon admitted. "My father is ill."

"And Dr. Argon is known to have lived on Mars, five years ago," went on the Secretary significantly. "His record is obscure, his reputation unsavory. Frankly, we believe him to be a sympathizer of Tormai's Martian trouble-making. And old Mr. Manning, if I must be wholly blunt, is known to be drawing very considerable funds from his personal Governmental deposits."

"Good God, I didn't know that!" Jon exclaimed. "Well, at any rate, that's his business, isn't it?"

"And perhaps it is our business also," the Secretary said. "What is your father doing with all that money? More than a million platinum-decimars in the past month. It's our concern, in view of these queer circumstances."

"My father is not a traitor," Jon flared.

A queer thrill almost akin to anger went through the listening Zeoh. This man in Great-London was trying to hurt his young master. It so queerly reacted on the slow brain of the worker, Zeoh, that his big fingers dangling at his sides were quivering and twitching.

"I tell you my father is not a traitor," Jon repeated. "He's ill—he's had almost a nervous breakdown." And then suddenly Jon's terror burst out.

"Oh, I can't pretend I'm not frightened, Mr. Blakinson," he added. "I—I'll take the dawn-flyer for Great-London tomorrow morning. I'll come and see you. There's something damnably queer about all this. I admit I'm worried about my father. But I've been helpless. I can't control him, you know. He'll tolerate no questions—no interference from me . . . Yes, yes, of course I'm hiding nothing from you. Father's been acting horribly strangely for a month. I admit that. But he's no traitor—"

WHEN the connection broke, for a long time young Jon Manning sat staring, his handsome boyish face white and terrified, his trembling hand rumpling his wavy black hair. He was just a boy, in desperate, mysterious trouble.

Over in the laboratory corner the big slow-thinking Zeoh still stood motionless. He could feel himself trembling inside. It was all so queer, so confusing. But he was quite sure now that Jon, and old Mr. Manning, were in desperate trouble.

It was frightening. And suddenly Zeoh wanted to do something about it. Within him was the impulse for action. Slowly he crossed the laboratory room and again stood over Jon.

"Tell me," he said. "Master, please tell me. What is the trouble? I do not understand."

There was no way by which Zeoh could understand such intricate affairs. Nor could he understand the startled look that Jon gave him.

"You want to understand, Zeoh? Why—Good Lord—"

"You told me when I came here to serve you, that you would explain everything I needed to know," Zeoh responded. "You are training me to my work. I want to serve you well."

"Why, Good Lord, you do serve me well, Zeoh. But there is nothing for you to do now. Go back to the corner and wait. I'll give you some orders presently."

But Zeoh only stood motionless. Inside him was a horrible confusion. Everything in him impelled him to respond to that order, "Go into the cor-

ner and wait." But now there was something else inside him, impelling him not to obey. The clash of impulses was horribly confusing. He wanted to think, because he knew that now there was something he wanted to do, of his own free-will—yet he had never been guilty of insubordination before.

"I want to learn everything," he said slowly. And the queer thought flashed to his brain that he had never wanted anything before outside of his work. "You're going away, Master?"

"Going to Great-London at dawn," Jon said. "But only for a day."

"Yes," Zeoh responded. "And your father, my old Master, is in trouble?"

"He's in horrible trouble," young Jon burst out. "He's in that damnable Pathological Sanatorium." Then suddenly Jon looked up, and his haggard boy-face tried to smile. "My God, Zeoh," he muttered. "It's weird that I should be telling you this."

"Please tell me," Zeoh said.

"I can't get father out of there," Jon exclaimed. "I saw him today. He—he's so changed! But he's master of himself, as always. He was angry with me. That's not like him, Zeoh."

"No, that is not like the old Master," Zeoh agreed.

"He ordered me out of the place—told me not to come again. And that damned sardonic Dr. Argon just stood and leered at me. And father treated me like a little boy."

"You want to get the old Master out of that place," Zeoh said slowly. "You are telling me that you want to get him out of that place."

"Yes. But I can't. And now they think father is doing something terribly wrong. My God, Zeoh, maybe he is—I don't know. But if he is, that Dr. Argon is making him do it. But how? I saw father, and talked with him. He's acting of his own free-will."

THEN the boyish Jon Manning laughed a little wildly with his terror. Zeoh's big, wide-shouldered body was trembling with the confusion of it, but he stood his ground. And suddenly his big hand went out and touched Jon's shoulder.

"I want to help," he said.

"You?" Young Jon stared. "You—what?"

"I want to help, whatever is the trouble, I want to work with it."

For another second Jon blankly stared.

"You couldn't help in this, Zeoh," he said finally. And then suddenly he studied his servant intently. "I'll talk with you when I return, Zeoh. Go to your place now and wait for your next orders."

"Yes, Master," Zeoh said. Obediently he went back across the room. And presently young Jon jumped from his chair.

"I'm going over to the house to pack my clothes," he said. "Tomorrow, Zeoh, you will take your orders from my assistant. I will be back the next day. You will have no trouble, I'm sure."

"Thank you," Zeoh responded.

The laboratory room was very silent when he was left alone. If only he could help! His whole body was quivering with the desire to do something. In the silence there was just the sizzle of the heat-torches and the slow bubbling of the viscous fluids in the big retorts.

Zeoh knew that young Jon in his terror had forgotten his work here with these retorts. The realization confused Zeoh. Should he turn off the heat torches? He stood for a moment; and then he moved quietly forward, bent and turned them off. The flourescent tubes went dark. The free-will action gave Zeoh enormous confidence. It was not hard to do things beyond one's orders.

For a moment, in the dim laboratory, he stood at the window peering out at the black night. He knew where the Aaron Pathological Institute was located. It was not more than a mile from here, up in the forest-clad hills. He had been there with old Mr. Manning on an errand a year ago.

Then Zeoh suddenly from head to foot was shaking with excitement. He knew at last what he was going to do.

There was no one to see Zeoh as very methodically he went out the back door of the laboratory, walked across the yard, followed the path and plunged

into the woods. He was frightened at first. It was so different from all the routine tasks to be doing things at last of his own free-will.

In the woods, he ran. There was no need here for silence, and when the path twisted, he shortened the distance with lumbering, crashing tread through the underbrush.

Young Jon wanted his father home. The old Master was sick. He would not want to come home, but he must. Dr. Argon was an enemy. These simple thoughts were easy to understand. And it was easy to act, with thoughts like that to direct one. Zeoh felt his quivering terror leaving him and a queer reaction, like triumph in a task well done, was coming to take its place.

But this task wasn't done yet; and as the dark outlines of the metal structure which was the Argon Pathological Institute loomed ahead of him, a caution came to the lumbering servant. He slackened his pace; and then at the edge of the woods, like a grim, dark statue he stood beside a rock, peering.

There were two buildings here in this cauldron-like open space surrounded by the woods. One was a long low, rambling metal structure which housed the laboratories of Dr. Argon—a weird, mysterious place where surgical operations were performed upon defective people. But for a month now it had been closed. It was wholly dark, tonight at midnight, silent and seemingly deserted.

The other building was nearby; a small, cubicle affair which was Dr. Argon's home. A low metal passageway like a snake along the ground connected it with the laboratories.

FROM a metal pouch at his waist the prowling Zeoh drew a microphonic listener. He clamped it at the side of his head as he slowly padded forward toward the laboratories. There was no sound coming from within. Not even the sound of breathing, which the magnifier would have made apparent. The place was deserted.

He had stalked past the laboratory corner when, at one of the lower windows of the little house, he saw a dim light shining. And now his electrically magnified hearing picked up voices.

"And what do you want me to do with him now that we're finished? He's himself tonight. Shall I treat him again?"

That was Dr. Argon's voice. Zeoh had heard it a year ago; his memory yielded recognition of its heavy timbre.

The other voice now sounded. It was a jargon of words that only clashed and jangled upon Zeoh's brain, and meant nothing. No worker like Zeoh was taught foreign languages.

"All right, kill him," Dr. Argon was saying callously. "I can prove sudden depressive insanity and that he committed suicide. You give me my share of the decimars, and I'm out of it."

Then the two voices were quarreling, perhaps about the money. Zeoh was close outside the window now. Its lower glassite pane was shrouded, but the upper one was partially lowered for air. Zeoh fitted a curve-ray lens over his eyes. As he turned on the current, the pallid violet beams sprang in an arc that curved up and through the window slit. The room's interior was revealed.

He saw the squat, heavy-set Dr. Argon. With the surgeon was a seven-foot giant of a manlike creature with a huge body upon bent spindly legs, and a bulbous head. It was Tormai, the Martian revolutionary leader.

The Martian stood with his silver, metal-fabric cloak wrapped around him and glared down at Dr. Argon. They were both jabbering now in the jargon of Martian language. Then the big Tormai turned and angrily stalked from the room.

Zeoh snapped off his curve-ray. It was becoming increasingly easy to think and act of his own free-will. He went to the little metal house-door farther along the wall. His tiny electro-heat torch was hanging at his metal belt. It hissed faintly as he turned it on, and under its sizzling heat the door-lock melted away like butter. The door yielded inward to the push of his huge shoulder.

He found himself in a dim, low-vaulted hallway. Down its length the figure of Tormai was vanishing in the direction of the laboratories. Swiftly Zeoh started after him.

Then from a dark door-oval came Argon's calling voice:

"All right—kill old Manning now. That suits me. My employees are coming back to work tomorrow. I can't keep up this isolation without people getting suspicious."

So Tormai and Argon were alone here, with Georg Manning, their prisoner. The old master was ill and must come home. Jon Manning had said so. That was enough for Zeoh.

Tormai vanished past an angle of the corridor just as the treacherous Dr. Argon came to the nearby door. In the dim blue tubelight he saw the advancing Zeoh. For a second Argon stared, his face blank with astonishment and then terror.

"Why—Good God!" he exclaimed. "What do you want? How did you get in, you damned—stop! Get back, I say!"

But Zeoh was not taking orders from him. He was no longer a simple servant that obeyed every order of any member of the ruling class. He was a worker in revolt to rescue an old master in danger. He continued to advance.

Argon reached in panic for a weapon at his belt. But with a pounce Zeoh seized him, snatched him up, held him like a child at arm's length. Argon screamed horribly as he struggled. But Zeoh hugged him, pressing him against his chest, until the screams died in a choked gurgle of blood. It mingled with the gruesome cracking of Argon's bones, and the blood of the villainous doctor spurted out in a horrible welter.

AT the turn of the corridor the huge Tormai had reappeared to gape in horror. Then his hand came up with an electric weapon. Zeoh saw the blue sizzling flash of the heat-volt. And then another came.

He felt the heat as he dropped the body of the dead doctor, and his huge left arm became useless. He could no longer control that member.

In that second Zeoh whirled and charged at the Martian. For a moment, there at the end of the hall, the big Martian stood his ground. Zeoh's arm hung limp as he ran forward.

"Back! Get back I say!" Tormai screamed in English. But within Zeoh there was only triumph at a job being well done. Tormai fired another bolt. It missed. It evidently was his last; for as the oncoming Zeoh neared him, he turned and fled.

But it was useless. He was trying to open the door in the narrow, snake-like passage to the laboratories when Zeoh caught him, and snatched him up with one hand. Like Argon, the big Martian's screams were horrible. Then Zeoh flung him down, stamping upon the Martian's head with his foot, mashing it into a gory, ghastly pulp of bones and blood and brains.

"Master! Old Master, where are you?" Zeoh called out as he opened the door and made his way toward the laboratories.

In the dark silence of the first laboratory; Zeoh at last heard the answering moan. And there was the old Master sitting in a corner with a chain upon his ankle like a dog tethered to the floor. He was haggard, trembling. He seemed dazed. But as he staggered to his feet with the chain clanking, he recognized Zeoh.

"You?" he gasped. "You, Zeoh?" He stared. "Where is Jon? How could you—"

Zeoh stooped to the floor and applied his enormous strength. His fingers swiftly severed the chain.

"I am acting of free-will, Master," Zeoh said proudly. "Argon and Tormai are your enemies. You are sick. You must come home."

Gently he gathered the old master up, and carefully holding him in the crook of his arm, he padded away.

* * * * *

The yard of the Manning Synthetic Food Products Company was crowded that next morning; a hundred newscasters and picture-makers rubbed shoulders with a group of Government officials and members of the World Police Shadow Squad. Georg Manning sat in a wheel-chair which had been rolled into the sunlight before the laboratory door. He was pale, nerve-shattered, but smiling, with the smiling young Jon beside him.

"They held my father under the in-

fluence of curarine," Jon explained. "We found Dr. Argon's notes on the subject. Quite evidently he has been experimenting with it for some time. It puts the body upon a lower plane of mental control—creates a dual personality with the baser nature controllable so that the drugged individual will do what he is told and still think that he is acting of his own volition."

"We've captured the bandit space-flyer," the World Police Commissioner announced to the newscasters. "It was loaded with contraband for Mars, and would have been gone in another few hours. Fortunately, Mr. Manning knew its location and with that damnable personality drug worn off last night, he was able to tell us."

Then suddenly a reporter was asking for Zeoh.

"He's the real hero," somebody called. "We want to see Zeoh."

"All right, he's here," young Jon said smilingly. He raised his voice. "Come outside, Zeoh."

IN the big laboratory door the ten-foot Zeoh appeared. Obediently he came into the laboratory yard with all the eyes of the assembled men staring at him in amazement and not a little trepidation.

"Yes, young Master," Zeoh said. "What do you wish?" He said it gently; inside he was vibrating with the triumph of a task well done.

Near him, a young reporter gasped.

"Why, it—he has a perfectly natural voice, Mr. Manning. He talks with expression—"

"The best product that ever came from my Windsor-Detroit plant," old Manning said proudly. "Ten years of service and now he has progressed suddenly into free-will action. I'm very proud of Zeoh."

"Thank you, Master," Zeoh said. No one was near him; no one had given him a verbal order. It was a free-will response.

"Why—my God, it thinks for itself," exclaimed the startled commissioner.

"Within the controlled limits of what I built into him," old Manning said, "he thinks now of his own free-will. Show them, Zeoh. Do anything you like."

IN the silence, as everyone stared with awe, Zeoh went back and forth in the yard with his lumbering, measured step, executing the old familiar routine of his training days. The sunlight gleamed on his ten-foot length of alunite body, his square metal shoulders, his square and impassive metal face. He could show no emotion save that his twin violet eye-beams were glowing with pride. His body-plates, newly polished for this morning, glistened resplendent. His great jointed legs worked smoothly. His jointed right arm went out with the huge mailed hand extended and the pincer-finger working.

But his left arm hung limp, inactive. The metal of the shoulder there was pitted, fused and scarred where Tormai's heat-bolt had struck. No matter. That would be fixed very easily when the expert arrived today from the Windsor-Detroit factories to make the repairs.

"Thank you very much, Zeoh," young Jon said, when the demonstration was finished. "Go back to your corner in the laboratory now and wait. I will have an order for you presently."

"Yes, Master," Zeoh responded. He clanked to the big laboratory doorway, stooped, passed through it and vanished inside.

And out in the sunlit yard, old Georg Manning, whose genius had created and built this Robot, was saying softly:

"Zeoh has had ten years of close association with humans. And you know, gentlemen, I'm wondering just how much of almost human feeling, and human reason, his ganglions of nerve-wires and his electronic brain cells are capable of generating."

Frank B. Long, Jr., Henry Kuttner, C. L. Moore, August W. Derleth, Ralph Milne Farley and Others in April STRANGE STORIES—15c at all Stands

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A department conducted for members of the international SCIENCE FICTION LEAGUE in the interest of science fiction and its promotion. We urge members to contribute any items of interest that they believe will be of value to the organization.

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GET ready for the most thrilling treat in the history of science fiction!

The June 1939 issue of THRILLING WONDER STORIES, marking a decade of progress, will soon be on sale at all newsstands. The country's most popular authors of science fiction have joined us in making THRILLING WONDER STORIES' tenth birthday number the most important issue in the magazine's existence. We are proud to announce the star parade of great stories and features scheduled for the very next number.

The most popular serial ever published in the old *Wonder Stories* was "The Time Stream", by John Taine. Other famous science fiction novels by John Taine include "White Lily", "Green Fire" and "The Purple Sapphire". We are gratified to announce that the feature story in the Tenth Anniversary Issue of T. W. S. will be "The Ultimate Catalyst", a novelet by John Taine which he has written especially for us.

Mention the name, Dr. Edward Elmer Smith, to a veteran science fiction fan, and you automatically revive memories of the greatest interplanetary stories ever written . . . The "Skylark" stories. "The Skylark of Space", "Triplanetary", and "The Skylark of Valeron" are but three of the immortal novels written by Dr. Smith. Now he appears for the first time in THRILLING WONDER STORIES with his first novelet, an interplanetary story, "Robot Nemesis".

SPECIAL SUPPLEMENT

No other author of science fiction has won such everlasting fame and appreciation as the late Stanley G. Weinbaum. It is our privilege to present, in our next issue, a special supplement

MOST POPULAR STORY IN FEBRUARY ISSUE

Here, in each issue, THRILLING WONDER STORIES announces the most popular story in the preceding issue. Whether it's a novelet, short story, or short short—your vote will designate your favorite story.

February's best-liked story, based on an analysis of all letters to the editor, was:

FLIGHT OF THE STARSHELL
A Novelet by
GORDON A. GILES

Second and third places, respectively, went to ARTHUR J. BURKS for THE DISCARDED VEIL and MAX C. SHERIDAN for THE HUMAN EQUATION.

Which do you consider the most outstanding science fiction story in this issue?

which will feature "Dawn of Flame", a complete short novel by this masterful writer. "Dawn of Flame" is not a sequel to "The Black Flame", published in the first issue of our companion magazine, STARTLING STORIES. "Dawn of Flame" is a fascinating story of Black Margot, the princess of power, published for the first time in magazine form.

To those thousands of readers who have been clamoring for the return of the leading science fiction writer of several years ago, Dr. David H. Keller, we take pleasure in announcing that we have secured a brand-new story by Dr. Keller, written especially for the Tenth Anniversary Issue. "No More Friction" is a typical Keller story, and we hope it is the forerunner of many more to come.

Long before science fiction started in this country, one man here was doing a giant's job making the reading public receptive to imaginative literature. That one man — Edgar Rice Burroughs. His "Tarzan" stories are internationally known. Likewise his novels of intrigue on Mars.

Now the two sons of Edgar Rice Burroughs follow in their father's footsteps. In their first science fiction novelet, "The Man Without a World", John Coleman Burroughs and Hulbert Burroughs have written a story so excellent that we think it readily deserves inclusion with the other great stories in our next issue. Let us know whether you think similarly.

—AND OTHERS

And there's a great deal more in store for you in our next issue! Stories by Jack Williamson, Eando Binder and others. The pictures and biographies of every one of your favorite authors! The pictures and biographies of all our artists! And other surprise features! And—the list of winners in our Scientific Hobby Contest.

Reserve your copy of the June THRILLING WONDER STORIES right now. And, incidentally, if you've been waiting for an all-star issue with which to convert your friends to science fiction, the June number will do the trick!

STARTLING STORIES

THE coming May issue of STARTLING STORIES will mark the third number of our new sister magazine. And we've lined up a top-notch book-length science fiction novel to be featured in this issue. It's by that popular author, Edmond Hamilton, well known for his many interesting serials, novelets and short stories.

Hamilton's novel is called THE PRISONER OF MARS. It's an utterly different type of science novel . . . the story of a man who owed allegiance to two worlds and had to decide on the destruction of one of them! If you like strong suspense, clever scientific speculation, and an original plot—then watch for THE PRISONER OF MARS.

The May issue of STARTLING STORIES also contains other science fiction winners by leading authors. Then, too, there's an all-time hit from fantasy literature appearing in SCIEN-

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TIFICATION'S HALL OF FAME. And you'll find S.S. as packed with science feature as T.W.S. Jack Binder's illustrated feature, THEY CHANGED THE WORLD, will acquaint you with the life of Robert A. Millikan, famous physicist. And then there are THRILLS IN SCIENCE, THE SCIENTIFIC CROSSWORD PUZZLE, and a science editorial. Look the issue over, then send us your report. We'd like to know how it compares with THRILLING WONDER STORIES.

AMATEUR AUTHORS CONTEST

Elsewhere in this issue appears THE BROKEN AXIOM, the first prize-winning story in our contest for amateur science-fiction writers. The second prize-winning story, THE COSMIC CUBE, by Graph Waldeyer, will appear in an early issue.

Amateur writers everywhere—send us your science fiction stories! Interplanetary, fourth-dimension, future sports—it doesn't make any difference what theme you use, just as long as you tell your tale as interestingly as possible. The length of these stories may be anywhere from 1,000 to 10,000 words.

Write up that pet plot you've been keeping under your hat all these years. We'd like to see it. If there's something to your story, you will have the gratification of seeing it published in THRILLING WONDER STORIES, and the—check! Prize stories are purchased at the same rates paid to our staff writers.

The requirements are simple. Authors must be amateurs. Anyone who has ever had anything published professionally is not eligible. Type your stories double-space on regular manuscript paper. And enclose a stamped, self-addressed envelope for the return of your manuscript if it is unavailable. Mail your stories to AMATEUR WRITERS' EDITOR, THRILLING WONDER STORIES, 22 W. 48th St., New York City. We want to present a brand-new writer in every issue. Why not try for the honor?

JOIN THE LEAGUE

Have you joined the SCIENCE FICTION LEAGUE yet? It's an international organization composed of the world's most enthusiastic followers of science fiction—and it fosters that intangible bond between all science fiction readers. Just fill out the application blank provided on Page 116.

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To obtain a FREE certificate of membership, tear off the namestrip of the cover of this magazine, so that the date and the title of the magazine show, and send it to SCIENCE FICTION LEAGUE, enclosing a stamped, self-addressed envelope.

And readers—write the editor of THRILLING WONDER STORIES a regular monthly letter. We want all your suggestions and criticisms. They are helping to make T.W.S. the type of magazine you want.—THE EDITOR.

CHAPTER NEWS AND GENERAL ACTIVITIES

LOS ANGELES

Meeting of November 17, 1938. Only fifteen at this meeting. Witnessing this growing apathy in Los Angeles, members held a serious discussion on how things could be made more interesting with hopes to getting more members. Members Mike and Corrinne Ellesworth dropped in, and served to enliven interest, for they were the only members of the club who heard **Orson Welles' "War of the Worlds" broadcast.** During the official meeting, vote was taken on the winning article in **Imagination's Dollar Prize Contest,** and reading some correspondence received in regards to the last issue of the mag. The winner of the contest was **Jack F. Speer,** with his article **After 1939, What?**

THE ANNUAL XMAS MEETING, December 15, 1938, or "Science-Fiction Fans show their spunk." Despite a heavy rainstorm which caused $25,000 damage in Los Angeles, science-fiction Fans showed that they still had some life in them, and rallied triumphantly to the banner in response to SOS cards sent out by a harassed Secretary, for at the Annual Xmas Meeting we had 22 members present, very good for the weather we were experiencing. All had a very gala time. There was a transcription of "Things to Come," played on a victrola by member Ackerman. During the period of attendance a large pile of gifts grew to enormous size. Finally, at the late hour of 9:45 the meeting was called to order. Director Hodgkins was unanimously elected to serve a third term. Then a "NO" vote on the dues lowering proposition was made and urged by the very promoters of the bill, on condition that with the added money, the club would publish some official stationery. Then the discussion on ways and means to make meetings more interesting. **A. Ross Kuntz, Charlie Henderson,** and **Ray Foulkes** vouched information that for a small sum old scientifictional pictures with a projector could be rented and shown in the Little Brown Room. Debates and lectures were also suggested.

In fact so many ideas flowed in that we were overwhelmed, and we promise that 1939 will see a crown year with the local chapter. After this was over, gifts were given out and when there proved to be too many, they were

auctioned off in a very comical auction in charge of **Charlie Henderson** and **David Ray Macky.**

All members went home at 11:15, looking forward to 1939, and with that we wish all scientifiction a Happy 1939. We meet every 1st and 3rd Thursdays of each month in the Little Brown Room, 3rd floor rear at Clifton's Café, 648 S. Broadway, L. A., from 6:00 on. Buy your lunch or get a pass check from cashier for nothing. For information inquire via post to T. Bruce Yerke, Sec'y, 1207½ N. Tamarind Ave., Hollywood, Calif., or call F. J. Ackerman, FEDeral 2231. Report by T. B. Yerke.

ANNOUNCING THE HOLLYWOOD CHAPTER OF THE S.F.L.

The Los Angeles Chapter of the S.F.L. wishes to announce that in order to accommodate the many potential members of our club who cannot attend because of the meeting night, we have made extensive plans to start a Hollywood Chapter of the S.F.L. Cards are being sent to former members who have quit because of press of other duties, giving them an opportunity to vote on what night is the most favorable. The officials of the sister chapter are: DIRECTOR—Charles Henderson; SECRETARY—T. Bruce Yerke, and TREASURER—Russel J. Hodgkins.

The club will meet at the St. Francis Hotel, corner of Hollywood Blvd. and Western Ave. at whatever time is decided upon. Members interested living in Hollywood, North Hollywood, West Hollywood, Beverly Hills, Van Nuys, and Los Feliz Dist. who cannot make the trip to Los Angeles form another potential source of membership. Those interested write Secretary T. Bruce Yerke, 1207½ N. Tamarind Ave., Hollywood, California.

TRI-CITY CHAPTER HIGHLAND, TEXAS

This tenth meeting opened 30 minutes late. As Wilkinson, the regular secretary, was absent, Reynolds was instructed to record the proceedings.

The director read a letter from HQ, one encouraging the chapter to still greater efforts.

A humorous poem by member Ellis was also read, an epic concerning the trials and tribulations of our leader. It bore the title: "The Ballad of the Browbeaten Director."

Then, forthwith, the director began to get things off his manly chest. He harangued as usual on the non-cooperation of the members.

Later, the subject of meeting times came up. Johnston made motion that meetings be held other than on Sundays. Motion tabled, without second or amendment, until the wishes of all members (some of whom were absent) could be learned.

The report that Wilkinson and the director had purchased a duplicator was given.

It was definitely decided that, for some time, meetings would be held monthly.

Idea of purity in stories discussed among other things.

CHAPTER NEWS

Abraham Oshinsky, of 2855 West 25th St., Brooklyn, New York, would like to organize an astronomy club in New York City. Will anyone interested please communicate with Mr. Oshinsky?

Mr. Allen R. Baker, of 3562 E. 140th St., Cleveland, Ohio, is desirous of being active in the formation of the Cleveland Chapter. Cleveland residents please contact Mr. Baker.

NEW MEMBERS

UNITED STATES

Robert H. Gray, New Haven, Conn.; Nick Henz, Chicago, Ill.; Dan King, Colorado Springs, Colorado; Melvin Silver, Brooklyn, New York; Allen R. Baker, Cleveland, Ohio; Jas. Clarkson, Vancouver, B. C., Can.; Lee Edwards, San Francisco, California; Stanley Howard, Jr., Baltimore, Maryland; J. T. Adams, New Orleans, La.; John J. Brent, New York City; Christian Anderson, Lake Ronkonkoma, New York; Alva Thomson, New York City; Harold DeFord, Brooklyn, New York; Jack Gans, Evanston, Ill.; Harvey Stege, Paramus, N. J.; C. Rae Martin, New Westminster, Canada; Stewart LeCato, Rehoboth, Del.; Edward O. Sculley, Taunton, Mass.; Murray S. Theaman, Brooklyn, New York; Harry Harrison, Jamaica, N. Y.; Charles Shepherd, Boise, Idaho; Joe Bertram, Jr., Detroit, Mich.; Donald Van Buskirk, Miami, Florida; Ray W. Martin, Vielmville, Calif.; Ralph C. Eisleben, Brooklyn, New York; H. G. Jacke, Manchester, New Hampshire; Fred Hurter, Ontario, Canada; W. Mackenzie, Minneapolis, Minn.; Stanley Helewitz, Miami Beach, Fla.; Sheldon Wolfe, Chicago, Ill.; Olaf M. Englesen, Brooklyn, New York; Raymond Manstis, Chicago, Ill.; Arthur Chambers, Brooklyn, New York; Norbert Smith, Glenflora, Wisc.; Clarence Eggert, Milwaukee, Wisc.; Richard Polk, Brooklyn, N. Y.; Charles June, Paterson, N. J.; William E. Simmons, Chicago, Ill.; E. Ray Ballard, Mustang, Colorado; Arthur Rourke, New York City; Frank Olcott, Jr., Pasadena, Calif.; Juan D. Vega, New York City; David Goldberg, New York City; Sigmund Rosenzviag, White Plains, New York; Robert Steveson, Stockton, Calif.

FOREIGN

Max Armstrong, New Zealand; Alfred E. Every, Port Elizabeth, South Africa; David G. Boadle, Willoughby, N.S.W., Australia.

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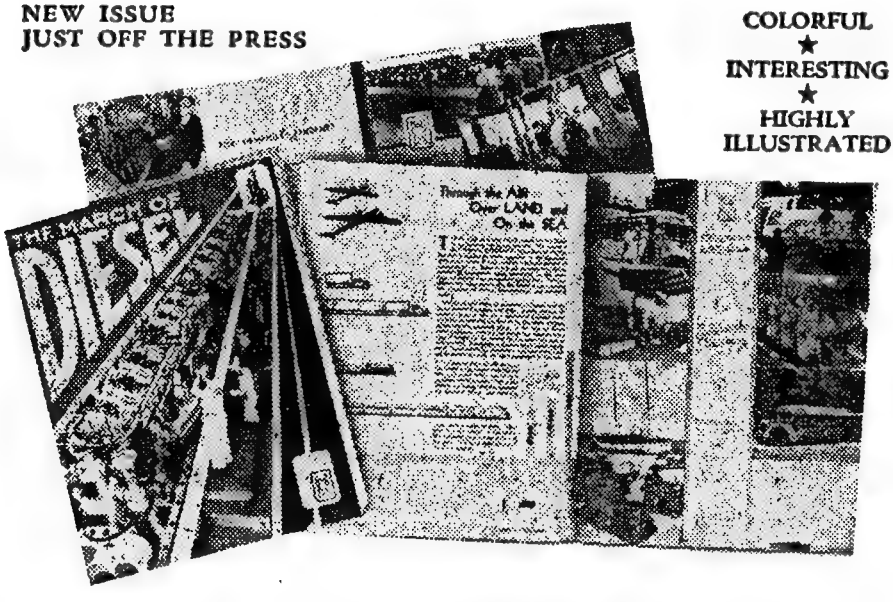

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SAYING IT IN MARTIAN

By Alan Saun

How do you do it? How do you put out one excellent issue after another? The latest one, February, 1939, was a "telfro" (Martian for gigantic.) The story I enjoyed the most was "Flight of the Starshell," by Gordon A. Giles. Its accompanying illustration was one of the best I've even seen. Who illustrated it? (A. Schomburg—Ed.) The next best story was "Moon of Mad Atavism," by Hal K. Wells. Marchioni's illustration for it was excellent.

The third story, "The Discarded Veil," was extremely interesting. There is only one word I can find to describe Schomburg's work, and that is "ethdork" (Martian for extraordinary.)

Your write-up of the coming Tenth Anniversary issue sounds so interesting that I would travel in my time-machine a few months in the future to get that number, but, alas, I can't. You see, a colleague of mine, Professor M. T. Head, borrowed my machine and never returned. — Toronto, Canada.

("Korfon!" [That's Martian for "tough luck, pal!"]—Ed.)

BOMB-TOSSING

By Jim Preisach

I have been taking THRILLING WONDER STORIES for quite awhile and I have saved up some bombs and some flowers. I will toss a bomb first. Now this matter of illustrations: what do we buy the magazine for, anyway? To look at pictures? No, shows are for that. So why all the fuss? This was rather a mild explosion, wasn't it, Mr. Editor? Well, this makes it even softer. I realize that the cover is what sells the magazine to new readers, so don't mind me. I do agree with Walter Sullivan about having fewer bloody covers. Now for the posies. Here's a call for lots of Kathleen and Quade and don't let Bill the Bouncer get it by a big bad monster. And by all means let that feud continue.

I would like to see more of Penton and Blake. There are two worlds and their moons that they haven't explored yet. In order of preference, best stories in your December issue were: "The Star Parade," "Tidal Moon," "Cosmic Hiss," "Hands Across the Void," "The Loot of Time," "The Metal Ocean," and "The Great Adventure."

I certainly will get the companion mag to T.W.S., STARTLING STORIES, if it has the same ed, authors, and similar features. And it sounds as if it does!—74 North St., LeRoy, N. Y.

In this department we shall publish your opinions every month. After all, this is YOUR magazine, and it is edited for YOU. If a story in THRILLING WONDER STORIES fails to click with you, it is up to you to let us know about it. We welcome your letters whether they are complimentary or critical — or contain good old-fashioned brickbats! Write regularly! As many of your letters as possible will be printed herein. We cannot undertake to enter into private correspondence.

BINDER BETTER

By Bernard Quinn

Swell cover on your February issue, best I've seen in some time. You'll probably have somebody on your neck because of it. They'll argue the sun h'aint that size when viewed from that distance in space. They'll be right. But who cares? You don't expect to find a scientific education on every cover.

Now I'll report on your stories. Liked "Flight of the Starshell" best, probably because I have a special preference for that type of story. "World Without Chance," followed with "Moon of Mad Atavism," then "The Discarded Veil." The others I leave to you.

Jack Binder seems to become better each time. I always glance at him first whenever I receive my copy. Paul did a swell job on that cut for "War of the Weeds." Congrats. Have read the two additions to our family, STARTLING STORIES and STRANGE STORIES. They're pretty good. —2567 Tulip Street, Phila., Pa.

VETO VOTES?

By Henry Roshier

We readers surely have to be good citizens to read T.W.S. nowadays. It's "Vote for a companion magazine," then "Vote for the best story in each issue," "Vote for this and that." Now it's vote for a long novel about Gerry Carlyle and Tony Quade.

But I'm game. I vote "yes." Kuttner and Barnes deserve a chance to do their masterpiece together. More power to them. —Los Angeles, Calif.

FLASH!

By Casimir Pierog

Congratulations! Was your June issue the Anniversary number? Liked "The Human Equation," "The Telepathic Tomb," best. Will wire you again when you get out as good an issue. —7605 Osage Ave., Cleveland, Ohio.

SCIENTIFICTION COVER

By T. Bruce Yerke

Even though the cover of the February issue was somewhat out of proportion (the sun and the other planets were far too large) the cover is the kind we want; I almost went wild with joy when I pulled the narrow end of the mag out of the news-rack, wondering what we had in this issue. Well, at last we've got a scientifiction cover on a scientifictional magazine.

"The Human Equation" was something like a story you had in an earlier issue of the magazine, but it was very good. "Moon of Mad Atavism" was the only story I didn't care for. "War of the Weeds" was typical of the old mysterious-plant-menace-from-space type, but its interesting presentation redeemed the familiar formula.

"Flight of the Starshell" was Gile's best, and was tops in the issue. "Invasion's End" was the runner-up, being quite original, and very interesting. Also "The Telepathic Tomb."

"The Discarded Veil" was in my estimation the best story Arthur J. Burks has ever written. It is definitely distinctive, quite outstanding from Burks' past attempts. The basis is convincing, for I have personally experienced the feeling of seeing something I have never seen before, and then being certain of having been in the vicinity before. Certainly the tale presented much food for thought. All the rest of the stories and features in the issue were very good, and may 1939 bring more and better stories.—1207½ N. Tamarind Ave., Hollywood, Calif.

TAINE BOOSTER

By Edward L. Corton, Jr.

Your February issue of THRILLING WONDER STORIES appeared yesterday, and one of the letters in THE READER SPEAKS compelled me to write you the first letter I have ever sent to a science fiction magazine. This was the letter from Arthur L. Widner, Jr. I wish to add my vote to his for reprint of "The Time Stream," by John Taine. For the past year and a half I have been combing bookstores trying to find the issues of your magazine in which this marvelous serial appeared. It is certainly the best time story I have ever read. I would like to read it again.

Of your current stories, the series about Hollywood on the Moon is interesting. The author has a good idea there. In the June issue, "The Man Who Looked Like Steinmetz" was excellent, as was "Terror in Utopia." Both of them had new plots. In the August issue, except for "Doom World," "The Green Ray" was best, chiefly because of its nicely handled melodramatic atmosphere of spies and espionage-intrigue. And in the October issue "The Brain Pirates" combined fantasy with adventure to lead the field. And your many features make

(Continued on page 120)

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(Continued from page 119)

THRILLING WONDER STORIES a decided asset.—1005 East 60th St., Chicago, Ill.

LIKES COMPANION MAG

By Robert Mastell

Thanks a lot for the December issue of T.W.S. Please consider the following stories as my pick of the best. "The Star Parade" was good, although the idea was a little confusing. "Hands Across the Void" was swell. The development was very natural. "The Loot of Time" had ingenuity in it, and I am sure it aroused our sympathies. "The Great Adventure" was a drab, out of the way story, and should never have been printed. Keep up the articles and features. They are not Greek and any normal person gets a kick out of science facts. SCIENCE QUIZ is a sure test for that science which you are supposed to know. Such features are found in few magazines.

The new magazine, STARTLING STORIES, was a dandy. So was "The Black Flame." Margaret of Urbs has character. The features I liked unanimously, except the scientific crossword puzzle. Couldn't you have something like "Scientific Inventions" or "Scientific Progress," in which you could discuss the "big eye," or television, or the Harvard Microscope? In closing, I'd like to say that I'm very interested in astronomy and I should be glad to correspond with anyone having similar interests.—2611 6th Ave., E., Hibbing, Minn.

BRAVO FOR FINLAY

By Ralph C. Hamilton

The cover on your February issue was the best I've ever seen on T.W.S., and the only one that could be called a work of art; the others have all been too glaring and blatant, mainly because of the violent and painful contrasts of the colors used: vivid reds and yellows, and so forth. But even this cover was, of course, spoiled somewhat by the lettering sprawled all over it. But please let us know who does your covers, by printing the name of the artist on the contents page, as do the other magazines. And apropos of illustrations, you've casually stated in a comment on a letter, what should be headline news: Virgil Finlay is to illustrate for the mag! He's probably the best illustrator in the pulp field, and certainly one of the few—very few—artists in that field; the rest are just illustrators.

Now that you've got him, please allow Marchioni to devote his time to drawing a Buck Rogers type comic strip; his peculiar talents seem to lie in that direction. His unnatural and artificially symmetrical monsters and humans are little better than "doodling." And Schomburg's drawings would look much better if he left out some of his "doodling"—I refer to the totally extraneous and irrelevant pieces of apparatus that he seems to think it necessary to include. It is unconvincing, and detracts needlessly from the center of interest.

But really, illustrations are a side issue. Stories? For low places I nominate Wells' "Moon of Mad Atavism" and Kummer's "Telepathic Tomb." Both were characterized by thin and unconvincing plots, as far as the scientific side of it was concerned. One comment on Wells production: I'm getting tired of the trite triangle consisting of an Earthman and girl, and a villainous and surprisingly anthropomorphic Martian. How come the Martian was so human, if the evolutionary chain back of him in no way resembled that of an Earthman? It's like having our line of anthropoid ancestors culminate in a four-legged ostrich instead of man.

Best story was "World Without Chance," because of the way in which the underlying idea was presented and developed, and because of the characterization. Good were "Flight of the Starshell" and "The Human Equation"; also Burks', Jacobi's and Krulfield's yarns. Note to Mr. Jacobi: Coronium has, I believe, been identified as oxygen in a peculiar state of atomic excitation. Mr. Burks: How fast did you say that glacier moved?

Having finished the sermon-essay, I retire. Good-by, and give us more covers like that, please.—920 College Ave., Wooster, Ohio.

WANTS LONGER NOVELETS

By Jack Darrow

In a box on Page 112 of the Dec. T.W.S. the editor asks—"Which do you consider the best science fiction story in this issue?" My choice is "Hands Across the Void," as fine a science fiction tale as I've read, and just full of human interest. A story whose hero, for a change, was not of Earth, but who loved it. An extremely well-written story.

Second place goes to "Tidal Moon." An interesting plot with intriguing alien creatures worthy of Stanley G. Weinbaum. A nice job.

Third place goes to two stories: "The Star Parade," the third in Henry Kuttner's great series, and "The Metal Ocean," Eando Binders new and novel conception of the Atlantic theme with its (to me) surprise ending. I was fooled into believing the story occurred in some future time.

The rest of the stories I won't classify, but no kicks. I'm sort of prejudiced on the possibility of time travel, but they do make interesting tales. STARTLING STORIES? Of course I have it. Swell mag.

Here's a request. How about some real novelet-length stories in T.W.S.? S.S. for book-lengths, of course, but it's stories between ten and twenty-five thousand words that I'd like to see in T.W.S. The present novelets should be much longer. If necessary, put out a bigger book. I wouldn't mind at all paying for more pages of fiction.

And why not try Schomburg on the cover? —3487 N. Francisco Ave., Chicago, Ill.

SEQUEL-SEEKER
By Robert A. Madle

First place for the Dec. issue goes to Will Garth for his very excellent short story, "Hands Across the Void." The author accomplished his intention in that he succeeded in making the Titan a real character.

I was pleased to note that Clifford D. Simak, who is constantly good, has returned to Wonder. His novelet, "The Loot of Time," embodied a very novel idea, and the story itself is greatly in need of a sequel. I'm sure your readers will be very interested to read the further adventures of Yancey, Cabot, Cameron, One-Eye and the others.

Helen Weinbaum seems to have mastered Stanley's style almost perfectly. Why not have her continue to write for T.W.S.? Obviously, she is quite capable. The other stories this issue were all interesting, and I believe you now have a real mature magazine.—333 E. Belgrade St., Philadelphia, Pa.

HIS HALL OF FAME
By Tony Strother

I have been reading T.W.S. for the last six issues. So in my first letter I'll tell you what I think of your magazine.

I read every s-f magazine, having started this year. The fact that after a year of trial, you might say, the fact that I am still buying your magazine speaks for itself. None

(Concluded on page 122)

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(Concluded from page 121)

of your stories has been really bad. You haven't had one unreadable one. And you have had several really good ones.

I've made out a list of the best stories for 1938. The ten best novelets and ten best shorts. Novelets first: 1—"Life Eternal," by Eando Binder; 2—"Hollywood on the Moon," by Henry Kuttner; 3—"Murder in the Void," by Edmond Hamilton; 4—"Terror in Utopia," by Paul Ernst; 5—"Doom World," by Henry Kuttner; 6—"The Green Ray," by Arthur L. Zagat; 7—"The Challenge of Atlantis," by Arthur J. Burks; 8—"The Loot of Time," by Clifford D. Simak; 9—"The Metal Ocean," by Eando Binder; 10—"The Infinite Enemy," by Jack Williamson.

These are not in any kind of order. I like them equally well. The shorts:

" Via Asteroid," by Gordon A. Giles; "The Changer of History," by Alexander Samalman; "Easy Money," by Edmond Hamilton; "The Great Illusion," by Will Garth; "Via Death," by Gordon A. Giles; "Cosmic Teletype," by Carl Jacobi; "Of Jovian Build," by Oscar J. Friend; "The Robot and the Lady," by Manly Wade Wellman; "Tidal Moon," by Stanley G. and Helen Weinbaum; "Hands Across the Void," by Will Garth.

This completes my list. I hope the opinions of another regular reader will help you to form a better magazine by determining the likes and dislikes of the majority. So long and the best of luck. You'll be hearing from me again.—5020 Dodge Street, Duluth, Minn.

PATRICIA IN WONDER-LAND

By Patricia Evans

—And now you have a female reader! Fortunately, desire for the unusual knows no distinction. I am one of those oft-mentioned persons who: "have been reading your magazine for two years but this is my first letter."

Speaking of time brings forth that the average age stated by fellow readers is about 16. This must not be taken as a standard however, for a great many that do not state their age are well past the twenties. Unfortunately, I do not speak from experience, being eighteen. T.W.S. appeals to the young because it is adventurous; to the mature because it is an escape mechanism.

If you are to keep up its standards, though, you will have to do much better than the "Doom World," which fell apart. Mr. Kuttner chuckled too loudly at his own sense of humor. Another thing, the drawings are really poor. Especially those illustrating "Doom World" and "The Exterminators." I'm surprised at you printing that type of tripe!

Author Ray Cummings brings back his "Tubby," in a recent issue. I hope that this mythical character makes a "comeback," for he certainly did flop a few months ago in a short story that you published.—635 Park Ave., N. Y. C.

STRIKE OUT STRIKE?

By Dan E. Wade

It can't be true! So I exclaimed when I read in a recent issue of our magazine the acclaim "The Exterminators" received. I didn't care for the story at all. It was punk. The plot was pretty frayed; but that isn't my main objection to the yarn. I think it could have been handled much better.

All the conversation in the story was awkwardly handled and I found myself counting the pages to the end it was so boring. The only reason I finished the story was so I could better criticize it. If the conversation had been breezy and witty as in J. W. Campbell's stories the story might have been good. Its literary value was nil and it contained no new or novel ideas. Just another RAY story.

I want to say that Campbell's "The Brain Pirates" and Barnes' "Satellite Five" were plenty interesting. Conversation and plot were well handled in both stories and both had good entertaining ideas in them. Barnes' "Green Hell" was mediocre and I thought his "The Hothouse Planet" would be the same. To my great surprise it was super-magnificent! His "The Dual World" wasn't quite as good, but "Satellite Five" was wonderful! I give Barnes an A plus for that one.

I think Barnes could help his "Gerry Carlyle" series a lot by sticking into his next yarn some big handsome lug that takes Carlyle's mind off Strike for awhile. Make it a triangle love affair because if the love element is kept the same as it is now, it may as well not exist. It's too tame.

Attention, Campbell! After you finish with Penton's and Blake's adventures on the eleventh and twelfth planets respectively, perhaps they could travel to one of the fixed stars where they could visit any number of worlds. If Morey, Arcott, and Wade could do it, so can Penton and Blake. Nothing's too good for them. Stick more humor in the series, Mr. Campbell. That's where "The Brainstealers of Mars" has your other stories beat.

Kuttner's series is swell. Also try an' get Neil R. Jones to write one of his "Professor Jameson" stories for you. That is a real series! What happened to Laurence Manning? I want a "Stranger Club" story from him.

I am for a companion science fiction magazine 100%. I hope it is a quarterly, large size, so we can get some longer stories preferably by E. Smith, Campbell, Barnes, Coblentz, Williamson and Manning. Remember "In Cavern Below" by Coblentz? More.—5127 Farrar St., Seattle, Wash.

FIRST LETTER

By Robert Shuster

This is the first time I have written in to your magazine. In the October issue I found a nice balance of fiction and true science. I enjoyed your stories in the following order: First, "The Brain Pirates." Sec-

ond, "Of Jovian Build," and third, "Satellite Five." In "The Challenge of Atlantis" there was a quality missing which prevents it from being better than average.

"Cosmic Teletype" and "Mind Out of Time" were only fair. "The Man Who Saw Too Much" and "The Lady and the Robot" were below average. I'd like to see a sequel to "The Brain Pirates."—16 Vermilyea Ave., N. Y. C.

SUPER-SUPER-SCIENTIFIC

By J. C. Hazelgrove

This letter is really in appreciation of the policy T.W.S. is adopting in printing the full-blooded type of science fiction we used to enjoy a few years back.

Recently your rival has been going all super-super-scientific, its pages jammed with jaw-cracking technical terms that few of its readers can possibly understand. I like science in a yarn, but when it predominates over a story, it robs the color of some. I am pleased to see that you are giving Wesso plenty of work, and though Brown's covers are good, I'd like to see Wesso there sometimes. So far as I am concerned, T.W.S. can stay bi-monthly forever, for the rarer its appearance, the more it is appreciated.

Only one recent story stood out above the others to my mind, that being Williamson's fantasy, "The Infinite Enemy." The cube-entity was fascinating. I was glad to see C. A. Smith make one of his rare but welcome appearances.

And you're answering letters at last! Good. Well, can you tell us where Frank R. Paul is, and if you can add him to your staff? A word of appreciation for Binder's interesting "If" series, and I welcome the appearance of another new artist, Schomburg.—13 Foundry Street, Brighton, Sussex, Eng.

(Thanks for the kind words. Paul is with us for keeps.—Ed.)

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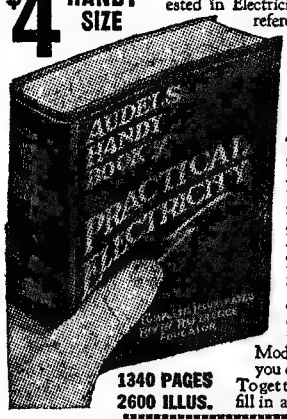

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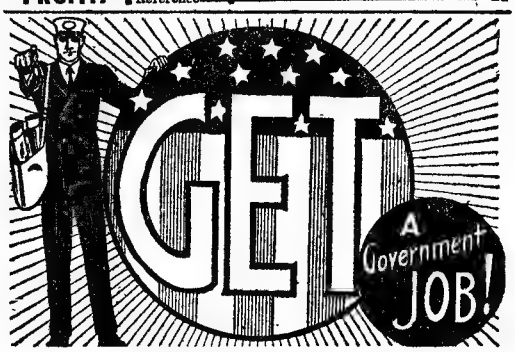

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THE STORY BEHIND THE STORY

TODAY'S headlines serve as the most potential source of inspiration for the science fiction writers of tomorrow! And we can prove it.

For example, it was the glamour associated with "Bring 'Em Back Alive" Frank Buck that inspired the Gerry Carlyle series by Arthur K. Barnes. Mr. Barnes thought it would be intriguing to write about the various strange forms of life existing on distant planets. And he was right—Gerry Carlyle, the female huntress who roams the nine worlds collecting alien creatures for the London Interplanetary Zoo, proved a big hit with our readers.

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And so it goes. Science fiction writers have but to saturate themselves with the world around us and they will be able to write of imaginary worlds.

GIRDLING THE SOLAR SYSTEM

The headlines announcing the thrilling flight of Howard Hughes around the globe are dry from the printer's ink, we'll admit. But nevertheless Eando Binder has found in them the nucleus for a novelet about the heroes of a coming age. THE JULES VERNE EXPRESS, streamlined with scientific thrills, transport the front-page news of today into a future environment. Here's how the author conceived the story:

Sometimes it is hard to pin down the genesis of a story-idea, but not in this case. The headlines about the Howard Hughes earth-girdling flight last summer were the direct inspiration of this story. I immediately thought of space fliers in the future setting records for an around-the-Solar-System flight. Simple, wasn't it? I can thank Howard Hughes and the newspapers for a "natural" story-germ.

BEST FUN, FICTION AND FOTOS *IN*

For the admirably fitted title I must credit the editors of THRILLING WONDER STORIES, who suggested the name of the ship. Jules Verne sent his hero around the world in 80 days, a "record"—and so set the inspiration for future record-breakers. And so we progress.

The velocities used in the story are perhaps a bit excessive, not so much from the standpoint of fuel, but human endurance. I had to assume a miraculous science eliminated as high as 60 gravities of acceleration. Not probable, I admit, but better for the coherence of the story. And I rather think that if, a hundred years ago, you had told even intelligent men that one day humans would fly 400 miles an hour, they would have been dubious about the result—to the body. All we know of space mechanics is theory. The facts, when we get them, may surprise us.

Record seekers, in any field, are pioneers. They risk their lives to blaze new trails, to show the way to those who are to follow. The odds are generally against them from the start. The first time is always the hardest. Add all these cliches up and you get—bravery. I tried to instill as much of that quality as possible into the narrative. Yet I know it falls far short of presenting the real spirit that drives such men.

THE EIGHTH DIMENSION

EVER since H. G. Wells introduced the "fourth dimension" to literature, scores of pseudo-scientific yarns have been written around that theme, utilizing the concept with variations. A few writers went further, embellished their stories with trimmings culled from the observations on Einstein's theories on this subject. But who would ever dream writing about—the eighth dimension?

The answer is, Frank Belknap Long, Jr. And in his novelet, WHITE BARRIER, he does that simple little trick. Maybe some day he can come back and tell us about the fifth, sixth, and seventh dimensions. We're still curious. At any rate, here's the author's lowdown on the story behind WHITE BARRIER:

White Barrier began with a vision. I was gazing at a globe of the world on my desk when my imagination took a fantastic liberty which startled me. The writing urge has to be set in motion, and when the animating spark is a vivid vision the results are usually more satisfying than when it's just a plot with an interplanetary setting.

I saw the terrestrial globe revolving behind my typewriter in a completely bisected state, one of its hemispheres enveloped in a tenuous haze, the other still intact. Then the haze-enveloped hemisphere dwindled and vanished altogether.

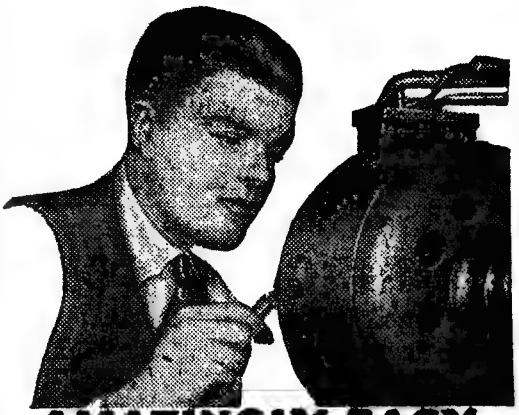
I got to wondering what would happen if the world should divide like that. I saw a half-globe spinning in the sky, still revolving about the sun and maintaining its integrity as a sphere.

Instantly amazing conjectures and possibilities leapt into my mind. What would happen to all the people on the surviving hemisphere, how would they react to a loss of half the world?

It would mean a tremendous shakeup, both physical and psychical. I envisaged nations adopting emergency measures of the most startling significance, individuals driven half-insane by the loss of relatives and friends, the mind of the human race exposed to a terror so appalling that there would be an upheaval surpassing the seething turmoil in a suddenly overturned nest of termites.

The story then unrolled before me, with the characters assuming traits which surprised me. Writers seldom know precisely in advance how their characters will behave

(Continued on page 126)



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(Continued from page 125)

when circumstances harass them, and in this story the circumstances were distinctly cataclysmic.

Perhaps it's a bit immodest for an author to praise his own brain children, but they met an unprecedented challenge with such quiet heroism and withal so audaciously that I feel I may be forgiven for saying that I am proud to have created them.

REPEALING THE LAWS OF PHYSICS

THE laws of physics state firmly that it is impossible for any one object to be in two places at the same time, or words to that effect. To Alfred Bester, winner in our amateur prize contest, that law meant a challenge. An interesting story could be written in which that law was shattered, he decided. THE BROKEN AXIOM is the result, and we hope you liked it. Here's what happened behind the scenes:

One never knows where the original idea for a story comes from. I suppose THE BROKEN AXIOM was lurking in the back of my mind for some time, in one form or another, before an incident brought it to my consciousness. Probably, if one were familiar enough with fantasia and science fiction, he might be able to point directly to the story from which I may have unconsciously cribbed the idea. Thank heaven I have no conscious guilt of any theft.

At any rate, the story began with an argument. At a discussion with some friends, someone mentioned the old playwrights' cliché—that if you create a set of characters and place them together, they'll work out a story for you by their own inter-reactions, characters, etc. I scoffed at the idea, being more or less a realist, and asked coldly whether this person thought every writer was like the author who inadvertently created Pirandello's "Six Characters" . . .

"It's ridiculous to expect the mind that subjectively creates certain characters to become objective by mental juggling and stand by as a mere observer," I said. "That's baloney!"

"Then how do you write?" challenged my friend; and that stumped me completely. In that circle of aesthetes I was ashamed to admit that I didn't have a theory about writing and I knew it would seem lame to say: "Oh, I just plain write when I get an idea." So I concocted a little something on the spur of the moment and said that I created a central paradox as a sort of major premise and then worked the story out on that basis.

"As, for instance?" badgered my friend.

"Oh," I hazarded. "For instance, I take a central character and give him a strange quality like walking through walls. Then I work out the succession of situations that this quality would lead him into, tack on a reasonable explanation beforehand . . . and

Thank God they all laughed at me and let the topic drop . . . but that was the inception of THE BROKEN AXIOM.

ALIEN LIFE

YOU don't have to include a hero in every science fiction story! At least, not according to the way Clifford D. Simak, author of MADNESS FROM MARS, looks at it. Mr. Simak's newest story has for its central character an alien, spherical being, a bundle of fur. And, regardless of the fact that "Fur-Ball" isn't human, hasn't even a name, we think him a first-class hero. Here's how Simak started the whole fur-ball rolling:

(Continued on page 128)

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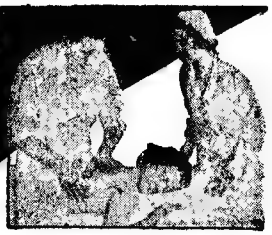

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State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared N. L. Pines, who, having been duly sworn according to law, deposes and says that he is the Publisher of Thrilling Wonder Stories, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, Better Publications, Inc., 22 West 48th Street, New York, N. Y.; Editor, Harvey Burns, 22 West 48th Street, New York, N. Y.; Managing Editor, none; Business Manager, H. L. Herbert, 22 West 48th St., New York, N. Y.

2. That the owner is: Better Publications, Inc., 22 West 48th Street, New York, N. Y.; N. L. Pines, 22 West 48th Street, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, or other securities are: none.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders, who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

N. L. PINES, Publisher.

Sworn to and subscribed before me this 3rd day of October, 1938. Eugene Wechsler, Notary Public, commission expires March 30, 1939.

THE STORY BEHIND THE STORY

(Continued from page 126)

Often it is hard for an author to put his finger on the exact incident or thought which stands forth as the genesis of a certain story. Such is the case with MADNESS FROM MARS. The story just grew. I suspect that the idea back of it is that when Man, breaking the ties of the Earth, ventures to other planets, he may not find the ferocious, bloodthirsty monstrosities so often pictured in science fiction. Instead he may find human little animals like Fur-Ball. This idea is not new . . . it has been used, perhaps with better success, by other writers.

How Fur-Ball came into being I cannot tell. But as I thought of him, he became very real to me. I felt sorry for the little beggar. I wanted to do something for him. And I believe that I had my characters do the best possible thing for him . . . the kindest thing they could have done under the circumstances.

Fur-Ball, incidentally, probably would be about the kind of an animal one would find on Mars. Conditions on that planet would mould certain characteristics in any type of life which existed there and the little spherical chap, with his thick covering of fur, would meet most of the planetary requirements for life.

MADNESS FROM MARS is not the story of the men who went to Mars and came back when others failed, nor the story of a scientist who figured out the particular problem presented in the yarn . . . it is Fur-Ball's story, first, last and all the time.

I hope the readers like him. To me he is a real being.

THE LINDBERGH PUMP

MEN MUST DIE, by Ward Hawkins, introduces a writer new to the pages of THRILLING WONDER STORIES. Mr. Hawkins is well known for his adventure and mystery tales in numerous other magazines, and we are certain that in science fiction he is due for equal popularity.

The laboratory experiments of Dr. Alexis Carrel in collaboration with Col. Charles A. Lindbergh have been widely reported everywhere. We've been waiting for someone to use the Lindbergh perfusion pump as the basis for a pseudo-scientific tale, and here's a case where a writer brand-new in the field has put one over on the old-timers. We thought you'd like to have the lowdown on Mr. Hawkins' biography as well as on the plot, so here's the info:

A letter from an editor requesting a "short biographical sketch" never fails to put me in a perfect dither. The truth is, I have so darned little to write about—no achievements, no great adventures. Up to this point, I have usually managed to make it sound good by distorting the facts a wee bit, and padding out with amusing incident an otherwise fleshless skeleton. But it seems that some of my little, shall we say extravagances, have kicked back on me—from this point on I fictionalize only my work.

Born the son of a Civil Engineer, it was only natural that when I was big enough to say I was old enough I followed the engineering game. But after a few years of dragging a chain over most of the Northwest it occurred to me that my destiny should be something more than looking through a transit, and college was the next step.

My intentions were the best, though I think there are certain Deans of Men who think otherwise. At least we didn't see eye to eye on several issues. As it turned out, the colleges (there were two of them) weren't big enough to hold both the Deans and myself,

BEST FUN, FICTION AND FOTOS IN

and rather than establish a precedent, I left. Thence back to engineering, and thence to writing.

Perhaps the one thing that remained solid from the beginning is an ardent love of science fiction. So then it's only natural that I should take a swing at it. The story MEN MUST DIE is my first effort in that direction—and if anyone finds something they want to fight about, I'll be as hard to find as a wholly new story about Jupiter. . . .

ANSWERS TO SCIENCE QUIZ ON PAGES 46-47

POSITIVE OR NEGATIVE

1. False. The best explanation is the application of the theory of relativity to the orbit calculations of Mercury.
2. True.
3. True.
4. False.
5. False. A nerve fiber must either respond with its whole capacity for response or not at all—the all-or-none law of nerve action.
6. True.
7. True.
8. False. The ions soon recombine and become neutral.
9. True.
10. True.
11. False. It's a refracting telescope. Concave mirrors are used for reflecting telescopes.
12. False. The term has reference to a special system of illumination for very minute objects rather than for magnifying power.
13. True.
14. True.
15. True.
16. True.
17. True. As proven by the Trojan group of asteroids.
18. False. The one exception is Phobos, inner moon of Mars, which has about one-third the rotation period of the planet.
19. True.
20. True. Due to its eccentric orbit Pluto is sometimes within 30 astronomical units from the sun. Neptune's mean distance from the sun is 30.057 astronomical units.

TAKE A LETTER

1. d; 2. b; 3. d; 4. a; 5. c; 6. b; 7. d; 8. a; 9. b; 10. a.

KEEP IN CIRCULATION

1. heart, 2. aorta, 3. lymph, 4. artery, 5. auricle, 6. jugular, 7. ventricle, 8. pulmonary, 9. corpuscle, 10. leucocyte, 11. hemoglobin, 12. pericardium.

PAIR PLAY

1. Pseudopodia, 2. Gills, 3. Perseid, 4. Proton, 5. Perigee.

IDENTIFY-OLOGY

1. The science of the physical facts concerning man and his development and history.
2. The science of the study of the relation of living things to their organic and inorganic environment.
3. The branch of biology treating of the structure of the tissues of organized bodies.
4. The branch of meteorology which treats of rain.
5. The branch of zoology that treats of fishes.
6. The phenomena of the atmosphere, especially those that relate to weather and climate.
7. A branch of biological science that treats of the form, parts and structure of plants and animals.
8. The science of organic life of past geologic ages.
9. The science of human vocal sounds, their relations to one another, and their interchanges.
10. The science of seaweeds.

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28x4.75-19	2.45	1.25
29x4.75-20	2.50	1.25
28x5.00-19	2.85	1.25
30x5.00-20	2.85	1.25
5.25-17	2.90	1.35
28x5.25-18	2.90	1.35
29x5.25-19	2.95	1.35
30x5.25-20	2.95	1.35
31x5.25-21	3.25	1.35
5.50-17	2.35	1.40
28x5.50-18	2.35	1.40
29x5.50-19	3.35	1.45
6.00-17	2.40	1.40
30x6.00-18	3.40	1.40
31x6.00-19	3.40	1.45
32x6.00-20	3.45	1.55
33x6.00-21	3.65	1.55
32x6.50-20	3.75	1.75
6.00-16	3.75	1.45

REGULAR CORD TIRES

Size	Tires	Tubes
30x3½	$2.35	$0.95
31x4	2.95	1.25
32x4	2.95	1.25
32x4	2.95	1.25
33x4	3.25	1.25
32x4½	3.25	1.45

HEAVY DUTY TRUCK TIRES (High Pressure)

Size	Tires	Tubes
30x5	$4.25	$1.95
32x6	2.95	1.75
34x7	4.25	2.25
36x8	7.95	2.95
40x8	9.95	4.45

TRUCK BALLOON TIRES

Size	Tires	Tubes
5.00-20	$5.75	$1.65
6.50-20	4.45	1.95
7.00-20	5.95	2.95

ALL OTHER SIZES

Size	Tires	Tubes
34x4½	$3.45	$1.45
34x4½	3.45	1.45
30x5	3.65	1.65
33x5	3.75	1.75
35x5	3.95	1.75

Size	Tires	Tubes
34x7	$10.95	$4.65
38x7	10.95	4.65
36x8	11.45	4.95
40x8	13.25	4.95

Size	Tires	Tubes
7.50-20	$6.95	$3.75
8.25-20	8.95	4.95
9.00-20	10.95	5.65
9.75-20	13.95	6.45

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☐ Contractor and Builder	☐ Telephone Work ☐ Radio	☐ Air Conditioning and Cooling	☐ Chemistry ☐ Pharmacy
☐ Structural Draftsman	☐ Mechanical Engineering	☐ Steam Engineer	☐ Coal Mining
☐ Structural Engineer	☐ Mechanical Draftsman	☐ Steam Electric Engineer	☐ Mine Foreman ☐ Fire Bosses
☐ Management of Inventions	☐ Machinist ☐ Toolmaker	☐ Marine Engineer	☐ Navigation
☐ Electrical Engineer	☐ Patternmaker	☐ R. R. Locomotives	☐ Cotton Manufacturing
☐ Electric Lighting	☐ Diesel Engines	☐ R. R. Section Foreman	☐ Woolen Manufacturing
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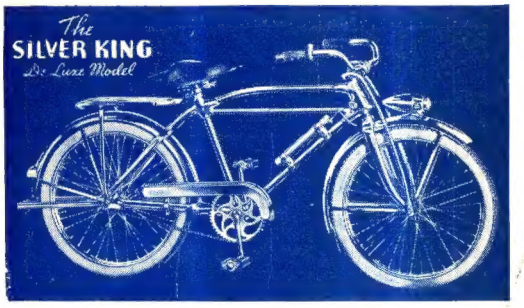
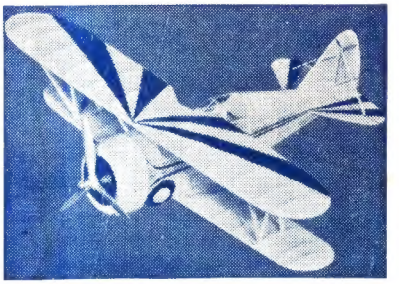


WOW! Three hundred prizes for boys. Earn anything you want—including the de luxe streamlined Silver King aluminum bike shown at the left. Comes to you fully equipped with blast hornlite, coaster brake, platform carrier, rear-wheel stand, balloon tires. Has lock built in the steering fork. Sturdy bow-arch double-bar frame, built low.

Earn this bike, a coaster wagon, typewriter, movie machine or anything else you want. Make MONEY, too. It's easy! It's fun! Just deliver The American Magazine, Woman's Home Companion and Collier's to customers whom you obtain in your neighborhood. Do it in spare time. Many boys earn a prize the first day. So can you. Mail coupon *today* to start. State age.

Pilot your own model plane. The Grumann Gulfhawk shown at the right is a daisy. Look at that 3-bladed prop; notice the markings on the fuselage and the retractable landing gear. Earn it! Mail the coupon to start.



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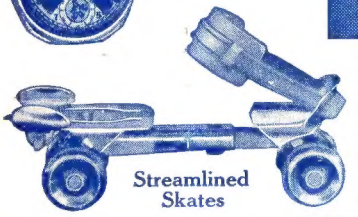

Streamlined Skates

When you begin rolling on these *streamlined* Globe skates you'll think you're on a bolt of greased lightning. You can earn them, any of 300 other big prizes, and make MONEY, too. Mail the coupon to start. Be the first boy in your neighborhood to get going.

Look at that 200-power microscope shown at the right! And a telescope, steam engine, wagon and a "Joe DiMaggio" baseball glove! Earn anything you want—or the whole lot! Make money at the same time. If you're not a boy between 12 and 15, show this offer to someone who is. Do it *now!*

Mail the Coupon to Start

Think of the fun you'll have—with all the prizes you want and your pockets full of spending money. It's easy for the ambitious boy. Some fellows earn a prize the first day. Get in the fun NOW and earn money and prizes for months to come. Mail the coupon to start. Be sure to give your age.

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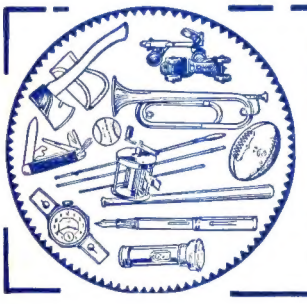
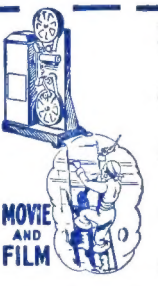
Earn These Prizes





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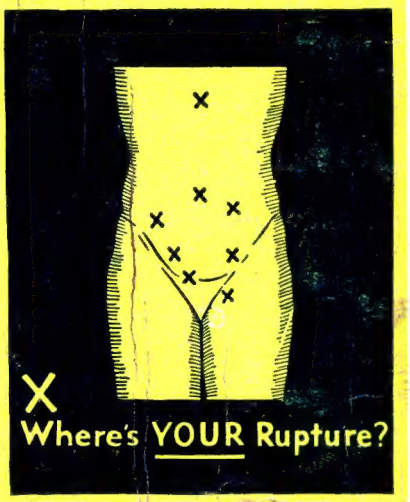

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